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JANUARY - FEBRUARY, 1950

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Official Journal of the Rocks and Minerals Association

Whole No. 214 Vol. 25, Nos. 1 - 2

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CHABAZITE v. PHACOLITE, Bohemia. Small x's. on rock. 3x2 ..... 1.50

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No lists furnished, but enquiries for specific minerals welcomed.

ROCKS and MINERALS

PUBLISHED MONTHLY

Edited and Published by PETER ZODAC

Jan.-Feb. 1950

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CHIPS FROM THE QUARRY

AMERICAN FEDERATION ANNOUNCES CONTEST WINNERS

Two youthful mineral collectors in Colorado and Michigan carried off top prizes in the first earth science essay contest sponsored by the American Federation of Mineralogical Societies.

The winning essays will be published in *Rocks and Minerals*.

Fred F. Meissner, 18 years old, 1080 South Gilpin, Denver, won first place with his article on "An Epsomite Occurrence in the Tintic District, Utah." He won a $25 Savings Bond and a mineral specimen to add to his already fine collection. Fred was a student at South High when he wrote his account of a collecting trip underground in the Chief Consolidated Mine near Eureka, Utah. He plans to graduate as a geological engineer from Colorado School of Mines at Golden.

Paul S. Hurd, 13 years old, 714 Columbia, St. Joseph, Mich., won second place with his article on "Fulgurites," sometimes known as petrified lightning. His prize was two large mineral specimens and several books. Paul, who lived in Benton Harbor when he submitted his essay, is in the eighth grade at Trinity Lutheran School. He collects minerals, including fulgurites, and Indian relics and also likes history and art. Paul credits his accomplishment to the interest of Harvey Franz of Benton Harbor, who helps him collect fulgurites in the sand dunes along Lake Michigan.

The contest was open to all boys and girls under twenty who had not yet enrolled in a college or university. Prof. Richard M. Pearl of Colorado College, former president of the Federation, managed the contest. The Judges, all of whom are active in popularizing the earth sciences, were Dr. Ben Hur Wilson of Joliet, Ill.; Arthur L. Flagg of Phoenix, Ariz.; and Orlin J. Bell of Oakland, Calif. The Federation officers hope to announce another essay contest this year.

TRAINER DONATES TILLY FOSTER COLLECTION TO STATE MUSEUM

Mr. John N. Trainer, of New York City, has donated his entire Tilly Foster collection to the State Museum in Albany, N. Y. There are at least 475 specimens in the collection and it will be displayed as a Tilly Foster Unit. Mr. Trainer spent nearly 15 years in assembling the collection. Both Mr. Trainer and the State Museum are to be commended for their part in the transaction—Mr. Trainer for donating the collection and the State Museum for its offer to display it as a Tilly Foster Unit.

The old abandoned iron mine (magnetite) at Tilly Foster, Putnam Co., N. Y. is one of America's best known localities and many articles on it have appeared in *Rocks and Minerals* and in other magazines as well. Now collectors can visit the New York State Museum in Albany and view a complete collection of the many interesting minerals for which Tilly Foster has long been famous.

REPRINTS AVAILABLE

There have been so many requests for reprints lately that the following bit of information may be of value. They can be supplied and at the following rates:

100 copies	2 pages	$ 3.75
100 copies	4 pages	7.25
100 copies	6 pages	10.25
100 copies	8 pages	12.75
100 copies	10 pages	15.00

All reprints must be ordered in advance, before the articles make their appearance in print.

ROCKS and MINERALS
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1950

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PETER ZODAC

A DESCRIPTION OF THE QUARTZ MINERALS FOUND AT BAYARD, NEBRASKA

By RICHARD S. MITCHELL
Box 612, Bayard, Nebr.

Many varieties of the mineral quartz are found in the sand hills near Bayard, Nebraska. This town is located near the western edge of Morrill County which is in western Nebraska.

Flowing south of Bayard is the North Platte River. The gravel from which the quartz minerals were collected was brought to the locality from the west, probably from the region which is now Wyoming, by the transporting action of the Platte River as it carved the now broad North Platte Valley from the original Miocene and Pliocene beds. The deposits of gravel were left scattered throughout the broad valley as the stream bed continually changed its course with the passing of time. The Miocene and Pliocene deposits mentioned above are themselves fluvial deposits that were spread as an immense debris apron east of the Rockies during the Cenozoic time. They included sand and gravel which also may have been left on the sand hills as residual material as the North Platte River eroded and carried away some of the smaller particles.

The quartz minerals found in the gravel beds throughout the entire North Platte Valley are the same as those found at Bayard because of the common origin. It should, therefore, be kept in mind that the description that follows is not only a picture of the Bayard quartz minerals, but one of the quartz minerals of the entire North Platte Valley.

Numerous representatives from each of the three groups of quartz are found. These groups of quartz are crystalline, cryptocrystalline, and clastic.

Crystalline Varieties

Perfectly transparent and flawless quartz pebbles were found. These pebbles are probably the water worn remains of rock crystal.

One specimen of quartz was found which shows the remains of quartz crystals which measure ¼ inch across. The crystals have been worn off but their bases remain as flat raised hexagons on the matrix rock. Another similar water worn specimen shows worn vertical sections of quartz crystals. The crystals of both of these specimens show "phantom" growth.

Small geodes of crystalline quartz are found in many types of cryptocrystalline quartz as jasper, basanite, and agate.

Drusy quartz crystals occur on numerous stones ranging from chalcedony to jasper.

As in any sand deposit, many specimens of the massive crystalline varieties of quartz are observed. Much milky quartz is present. Ferruginous quartz and pink or "rose" quartz is also found.

Many attractive pieces of green aventurine were picked up. The green color is due to the presence of glistening scales of chlorite.

Cryptocrystalline Varieties

CHALCEDONY is a very abundant variety of quartz in these western Nebraska sand deposits. Clear, white, gray, yellow, yellow-brown, brown, and pink specimens were found. This mineral occurs in the form of nodules (clear, white, and gray), and in platy and larger irregular masses (brown).

A number of the specimens show a green fluorescence when exposed to ultraviolet rays. One stone gives an indication that its fluorescence may be due to an admixture of opal within it. As a general rule, however, this is not the case. The fluorescence of all the specimens is probably due to a trace of some uranium salt. Brown, gray, and yellow specimens have each shown fluorescence.

One attractive piece of chalcedony is ropelike in appearance and has drusy quartz crystals on its surface in some areas.

Some small chalcedonic geodes were also found.

A large specimen of "beckite" was collected. This is white and gray botryoidal chalcedony on a base of impure pink quartz. When certain of the spherical masses of this stone were ground flat it was revealed that the chalcedony grew in concentric rings around a hexagonal center which was probably a small hexagonal crystal. (See Fig. 1).

Two specimens appear to be chalcedonized wood. The material is very translucent.

AGATE, which is chalcedony with definite markings of some kind, was found in the form of several varieties at the locality under discussion.

Moss agate was found in nodules and in large irregular pieces. Some of the moss agates collected are very similar to those from Sweetwater County, Wyoming. These are clear chalcedony with small dendritic inclusions of manganese dioxide. A beautiful green fluorescence is exhibited in some of the Bayard specimens. This is also true of the Sweetwater agates. This similarity may be a coincidence or it may indicate a common origin for the agates of the two localities. Other minor varieties of moss agate were collected. Red, yellow. brown, and gray chalcedony have been found with black dendritic inclusions of manganese dioxide. Some of these inclusions are small spots the size of a pinhead.

In connection with this discussion of moss agates an interesting combination should be described. Some specimens of "moss" limestone surrounded by a crust of moss agate were found. Two of these show a green fluorescence. (See Fig. 2).

One dendritic limestone nodule is surrounded by a crust or layer of common white opal.

Many specimens of limestone were found which are entirely covered with a crust of siliceous material. Specimens that are red, pink, purple, gray, black, and brown were collected. The crust of one specimen collected contains a small silicified brachiopod shell. In many cases the limestone has been completely removed by natural chemical processes and a thin frame of siliceous material is left.

One specimen, which is similar in appearance to those described above, is pink dendritic agate surrounded by a crust of common opal.

A very nice *eye agate* was found. The colors are arranged in concentric rings in the following order from the outer edge to the center: dark brown, light brown . . . dark brown, light brown, white, deep pink, red, white, and pink. This specimen is a brown nodule. A white nodule with the same outer appearance as this brown nodule was also found. It revealed an imperfect "eye" of the following colors as one approaches the center: white, gray, pink, and red-brown.

One small *sagenite agate* was noticed. It consists of white inclusions in a yellow chalcedony.

Chalcedony with white frostlike markings was found. These white markings are due to growths of siliceous material within the chalcedony, which have a slightly different composition from the chalcedony. Light brown, brown, golden-brown, red-brown, red, light gray, dark gray, and black *frost agates* were observed. One specimen not only contains the frostlike markings, but also dendritic markings of manganese dioxide. This might well be called a moss frost agate. A greenish fluorescence is observed in one light gray frost agate.

One interesting agate specimen consists of a spherical nodule of red jasper surrounded by concentric layers of gray and white chalcedony. The outer surface is covered with crystalline quartz.

Some pieces of jasper were encountered that contain small perfect *fortification agates*. One specimen consists of purple jasper with a red agate; another consists of brown jasper with layers of white and clear agate. Fortification agates are also sometimes revealed when certain chalcedonic nodules are broken open.

Numerous small pebbles of dark red *carnelian* were collected.

Pitch black agate was also found. This

variety is called *onyx*.

Translucent *agatized wood* was observed.

Chalcedonic silica with small circular spots, which give the agate the appearance of spotted calico cloth, was found. This variety has been called *polka-dot agate*. The following color combinations were collected: gray matrix with black and dark gray spots; white and light gray matrix with gray spots; pink matrix with light red spots.

A number of fluorescent agates were observed. Fluorescent moss agate and frost agate were mentioned previously in this description. A few dark drab colored agates show this phenomenon. Certain gray agates streaked with white also become green under the ultraviolet light. The fluorescence of these stones is probably due to the presence of a small amount of some uranium salt.

JASPER is very abundant on the hills under discussion. Many varieties are found. In color, the jasper found is white, yellow, brown (many shades), pink, red, dark red, purple, gray, gray green, green, or black.

Many brown moss jasper specimens were found. The various stones differ greatly with respect to texture, shades of brown, size of markings, and color of markings. Some pieces seen had black markings, others, red markings, and still others, both red and black markings.

Dendritic patterns were also observed in pink and gray jaspers.

Many attractive pieces of jasper were found which consist of layers of various colors. Each specimen of this type is limited to two colors. Some color combinations observed are black and brown, brown and tan, and white and gray.

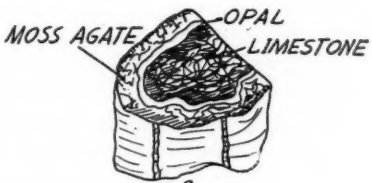
Most of the jasper at the Bayard locality is found as irregular pieces, but a certain bright red variety occurs in the form of small nodules. A few yellow nodules were also seen.

SECTION OF BECKITE

1

EYE FLINT

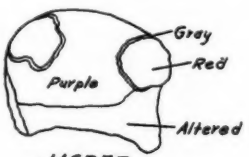
4



2

BAYARD EGG

5



JASPER

3

BAYARD EGG

6

Drawings of some quartz minerals found at Bayard, Nebr.

A number of specimens were collected which consist of dark red jasper intermixed with white finely crystalline quartz. These are quite attractive when polished.

One beautiful dark purple jasper specimen was found containing spherical balls of bright red jasper. One of these balls contains a patch of yellow at its center. Separating the purple jasper from the spherical masses is a thin layer of gray jasper. (See Fig. 3).

Numerous brown specimens of jasper were collected which are traversed with many veinlets of clear chalcedony.

A poor piece of bloodstone was collected. This consists of light green jasper speckled with small red dots. The jasper is mixed in with a finely crystalline but massive variety of white quartz.

Puddingstone or conglomeritic jasper is present. These rocks contain small rounded pebbles of red, yellow, gray, and white jasper.

Two nodules of fossiliferous quartz material which resemble eyes in appearance were found. The writer believes this mineral is flint and has given the name "eye flint" to the specimens. (See Fig. 4).

Massive brown specimens were found which also contain very small fossil sea organisms as a main constituent. The conchoidal fracture of this flint is not effected by those fossils.

CHERT. Many types of chert are found scattered over the Bayard sand hills. This variety appears to be a quartz pseudomorph after limestone.

"Bayard eggs" are very abundant. A "Bayard egg" is a chert (or flint?) nodule which appears to be pitch black or dark gray throughout, but when broken open is red, orange, yellow, or gray (mixed with yellow) on the inside.* (See Fig. 5).

The "yolks" are not always a solid color but may be spotted. Some consist of alternating rings of red and yellow. (See Fig. 6).

A number of the "eggs" have a contrasting layer of yellow or red between the outer "shell" and the inner "yolk."

The "yolk" of one specimen contains a small geode of quartz crystals.

A number of the "Bayard eggs" contain fossils in the "yolk" or imprinted upon the outer surface. Brachiopods, bryozoan, and crinoid stems were observed. Three specimens contain excellent cavities where sections of crinoid stems had existed. The crinoid imprint of one is covered with small glistening quartz crystals.

Other types of chert and flint "eggs" were observed at Bayard. These consist of a great diversity of colors. The following list is of the color combinations seen:

"shell"	"white"	"yolk"
white		brown and red
white	brown	tan
white		gray
white	red	purple
dirty white		brown (dendritic)
dirty white		gray (dendritic)
light gray	dark gray	red and orange
light gray	dark gray	crystalline center
light gray	black	gray
gray	yellow	orange or yellow
gray		red
gray	black	orange
gray		purple
brown	gray	purple
pink	brown	yellow
red	gray	red
orange		red
purple	yellow	red
purple	dark red	purple

Massive pieces of chert were found at Bayard which contain interesting shell fossils.

Brachiopods* were seen imprinted on specimens of the following colors: white, yellow, brown, red, purple, gray, and black.

One specimen is made up entirely of brachiopods and other types of sea life. This is very compact and its conchoidal fracture is not altered because of these building blocks of quartz shells, pseudomorph after calcium carbonate. The rock is basically gray, but the shells stand out as white lines and markings.

*"Bayard egg" was first described in *Bayard, Nebraska, Quartz Minerals,* Richard Mitchell, *Rocks and Minerals,* Vol. 21, Jan. 1946, P. 29.

*Some of these fossils may be of pelecypoda of the mollusca phylum.

Numerous types and colors of chert show crinoid stems. They are found in massive varieties of chert as well as in the unique black nodules called "Bayard egg," which were discussed previously.

A nice bryozoan was found in a bright red pebble of chert. This type of fossil was also mentioned in connection with the "Bayard egg."

Another distinct type of specimen has the fossil incorporated within it. These fossils appear to be a small type of cup coral. This type of rock is purple, red, pink, white, gray, or nearly black.

Silicified wood is quite abundant in these western Nebraska deposits. The pieces are all badly weathered and are quite small. One specimen measuring 10 inches by 5 inches was found by the writer and larger pieces probably exist.

Some specimens have the dull appearance of sandpapered wood while others have a highly vitreous luster. The grain of the wood is seen without any difficulty in most cases. As a general rule there are no bright colors—they are either light gray, brown, or black. However, some jasperized wood which is highly colored was found. The colors seen were red, yellow, and green.

Clastic Varieties

Many bodies of fine quartz sand were noticed in the gravel beds. Also much quartz sand is intermingled with the gravel and larger rocks.

Many types of sandstone—consolidated sand—were found as small chunks scattered on the gravel beds. Various varieties of quartz conglomerate were also noticed.

Metamorphosed sandstone or quartzite is also quite abundant. White, gray, brown, red, and yellow specimens were noticed.

TWO NEW MINERALIGHTS ON MARKET

After two years of intensive research, Ultra-Violet Products, Inc., of South Pasadena, California, announces two new models of lamps with greatly improved efficiency over other MINERALIGHT models. These lamps operate not only from 110-volt A. C., but also from 110-volt D. C., or from batteries. There are both short wave and long wave lamps, streamlined in design, and light in weight so the units are easily held in the hand. They are considerably lower in price compared to previous models of comparable intensity, and carrying cases are available which are equipped with a daylight viewing aperture and a place for the batteries.

Ultra-violet light has been used extensively in many research problems, and commercially in geological work, petroleum analysis, laboratory work, and hobby applications. Ultra-violet lamps create a fluorescent response in many chemicals and materials.

Complete descriptive literature is available from the manufacturer.

A Pretty Collector Tests One of the New Ultra-violet Lamps—Model SL Mineralight

GARNETS IN THE LAND DOWN UNDER

Part One

By JOHN N. TRAINER
274 Madison Ave., New York 16, N. Y.

In his studies on garnets the writer has been impressed by the lack of information about Australian garnets among collectors in the United States and by the small number of specimens in our museums and private collections. The only paper published in America on the subject was in the *American Mineralogist* in 1928. If any private collectors have specimens, the writer has not heard about them except Mr. C. S. Knowlton in California. The National Museum in Washington has six specimens. The American Museum of Natural History has none on display but has some study material, uvarovite, and spessartite both from New South Wales. The Chicago Museum of Natural History and Harvard University have only uvarovites. The writer's collection of twenty-four specimens from thirteen localities is probably the largest in this country.

An investigation of this condition was in order. The garnet is an ubiquitous mineral. Australia is almost the size of the United States and well-known for opals and for rich deposits of commercial minerals and precious stones. At one time during World War II there were more than two million American servicemen in Australia and they brought back brides, "cat's-eyes" and opals but no garnets!

The writer has been able to get in touch with only two dealers and two private collectors in Australia after many months of inquiry but believes there must be more. Mr. M. Mawby, the director of Exploration and Research of the Zinc Corporation of Australia was in New York recently and called on and gave interesting information to the writer. He says that most of the mineral specimens including garnets are in the state and university museums in Canberra, Brisbane, Sydney, Melbourne, Adelaide and Perth. The largest collection of garnets in Australia (six hundred specimens) is in the Australian Museum in Sydney and the next is the Simpson Collection in the State Museum at Perth, in southwest Australia, with forty specimens. This is a great handicap for an American investigator. Time, distance and expense prevent a trip to Australia to examine the collections.

One of the dealers writes: "Australians are, generally speaking, not interested in collecting mineral specimens. The best outlet for my specimens is overseas, and from here it is difficult to know their value in another country. Then again, there is the problem of getting a suitable agent. Good specimens are not easily come by. Expenses are very heavy. If a man had to go, say, fifty miles over rough roads, for only one or two specimens which had a ready sale, they would undoubtedly be very expensive and not worth while."

Australians are not mineral minded, to the extent that we are here in America. There is little collecting for research or for pleasure. There are no clubs or societies like our New York Mineralogical Club and The Mineralogical Society of America. New York City has about the same population as all Australia but it has many mineral collectors. Although the population of Australia is scattered over a vast territory, there are centres like Sydney and Melbourne, each with over a million people where one might expect to find many collectors and mineral societies. But not so. There is almost no amateur interest to stimulate the collecting and study of minerals.

Australia is a great mining country. Large areas have been exploited for gold, silver, copper, lead, tin, mica, zinc, opals, diamonds, rubies, sapphires, zircons and other commercial minerals and precious stones. A few garnets suitable for gem cutting are collected and sold but garnets as collectors' specimens are ugly ducklings and are tossed on the dumps. They are quite incidental to commercial mining.

Two main sources of information were Australian publications in the library of

The American Museum of Natural History supplemented by personal letters and personal reports from museums, universities and individuals in Australia. The museums have cheerfully answered inquiries and have supplied much useful up-to-date information with one exception.

The reports of the surveys of the Commonwealth, of the state departments of mines and of the various Royal Societies and scientific bodies in the library of our museum are numerous and very useful but one has to go through a long list of references to find material on garnets. Much had to be read which was not pertinent. The references at the end of this paper are only about half of those which were read. All are old except for the Census of West Australia minerals in 1945. Many more garnet occurrences must have since been found than have yet been reported. In fact, most of the information is a matter of history. There is comparatively little of current interest.

Garnets, being incidental to commercial operations, are inadequately described as to species, crystal forms, modes of occurrence and other details. They may be garnet rocks or masses, sands or waterworn fragments in alluvia or "washes" which have been panned for gold and gems. Frequently garnets are designated as "good" which means fragments and nodules, good as cutting material but not as hand specimens in the matrix for display in museums and private collections. In the latest census, the one for West Australia mentioned above, many are listed as "garnet"—nothing else.

The surveys of Queensland give the most details. The ninety garnet localities in this state are described as so many miles in certain directions from certain points so that you might drive right up to them if the roads permitted.

The late Dr. E. S. Simpson, the late T. Hodge-Smith, Mr. George Smith and Sir Douglas Mawson have written extensively on Australian minerals, and Dr. Simpson and T. Hodge-Smith especially on garnets. Dr. Simpson was state mineralogist of Western Australia and his collection, including about forty garnets, is now in the Western Australia Museum at Perth.

The writer has listed with misgivings, doubts and reservations over four hundred garnet localities in Australia. There might easily be twice as many. Some of the censuses are old. The latest is for Western Australia in which one hundred and ten garnet localities are enumerated and this state is less developed than the others.

Mr. Mawby writes: "I would like you to understand that in Australia there are really several hundred localities in which garnets occur.

Australia has a large Pre-Cambrian shield, and as the result of the metamorphic processes which have taken a prominent part in Pre-Cambrian geology, there has been produced a tremendous amount of garnet. In the Pre-Cambrian areas garnets occur as a primary crystallization in igneous rocks (for example in the pegmatites of the Broken Hill and Wodgina districts); as constituents of metamorphic sediments (for example the almandites of the Broken Hill district) or as secondary formations due to the action of mineralizing agencies (for example the spessartite of the Broken Hill lode).

In the Palaeozoic areas the garnets mostly result from contact metamorphism. In such cases the composition of the garnet is dependent upon the composition of the intrusive rock or mineralizing agencies and the invaded sediments (for example the uvarovite of Lucknow, N. S. W., and the lime garnets of King Island).

In the Tertiery deep leads of the Pleistocene and Recent alluvial deposits the garnets are derived from the denudation of Tertiery land surfaces and are concentrated with such resistent minerals as gold, cassiterite, zircon, rutile, ilmenite, magnetite, etc."

The writer likes to lay out a map and put a finger on the garnet localities as can be done in this country but it is very difficult to do so in Australia. Occurrences are listed without exact localities (except in Queensland) or as in certain mining fields or districts, such as for instance the Anakie Sapphire Field,

the Lucknow Gold Field, the Barrier and other ranges, the Kimberly "Division" and the Wodgina District. In general, exact localities are hard to get. The species are given for only about two hundred and fifty occurrences and they run in about the same proportions as in America with almandite leading, andradite second and grossularite, spessartite, pyrope and uvarovite in the order named.

The best, or most interesting districts for garnets, are the Barrier Range (Broken Hill and other points) in the western part of New South Wales, the Oberon-Tarana-Yetholme district in New South Wales, the Lucknow gold field in New South Wales, the MacDonnell and Harts ranges (Alice Springs) in Central Australia, the Wodgina tantalum district in Kimberly in the northern area of Western Australia, and King Island in Bass Strait between Victoria and Tasmania.

The garnet localities have names which are characteristic of the country, but strange to American ears—from Adjinbilly to Yinniethera with Cooglegong, Mullagup, Tabba-Tabba, Toodyay, Uaroo and Wahgunyak and others between A and Z. Double OO's are all over the map. But doubtless some of our place names like Coeur D'Alene, Michigamme, Peekskill, Siskiyou and Yerington sound equally foreign to Australians. Strange place names and unusual occurrences might well be expected in this land of kangaroos, platypuses, lyre birds, the tallest trees in the world, dingoes, the lovable koala and the laughing kookaburra birds; it is true that these have nothing to do with garnets but they remind one to be on the watch for oddities and unusual conditions.

Outstanding is the almost total lack of private collections as noted above. Mr. Mawby who has a large collection in his Melbourne home says that there must be others than himself but that he has not heard of them.

Another unusual feature is the frequency of garnets in "washings" and alluvial deposits which is explained by the fact that prospectors, aided by government agencies, concentrate on gold, silver, rubies, sapphires and other commercial minerals and are interested in garnets, if at all, only as cutting material.

The minerals associated with garnets are many and are an important feature of the Australian occurrences. They include most of those familiar to us, such as the pegmatite minerals, and, in addition, many which are unusual or rare—gold, diamonds, cerargyrite, embolite, galena, ruby, sapphire, cassiterite, molybdenite, scheelite, graphite, kyanite, zircon, chondrodite, pyrite, fuchsite, rutile, marcasite, vesuvianite, wollastonite, epidote, the copper minerals and others mentioned in the occurrences described below.

New South Wales and the whole southeastern area of Australia is the best developed as to commercial minerals as well as precious and semi-precious stones, but most areas of the continent are comparatively undeveloped because of physical and climatic conditions. Roads, water and petrol are certainly hard to find in the inland arid areas and generally in northern and northwestern Australia. This is admittedly a considerable part of the continent. On the other hand all necessary facilities are to be found for example over all of Victoria, practically all of New South Wales, the coastal and highland areas of Queensland as far north as Cairns, quite a large part of Western Queensland and South Australia, and in South Western Australia. The only railroad across southern Australia must carry in tank cars the water for the locomotives for about eleven hundred miles. Water from shallow wells and springs cannot be used and is not potable. The description of this area reads like a huge Mojave Desert. The "mushers" of Ontario and the gold seekers in California, by contrast, moved about freely and found water and game as food for themselves and forage for dogs and burros. Prospecting by plane is already opening up Australia, all flying inland is by land planes but is limited by the rough terrain although the country is not entirely lacking in airdromes even in Central and Northern Australia.

The Australian News and Information Bureau publishes maps (Figure 1), which aid in understanding the geography and topography of the coutry. Since this map

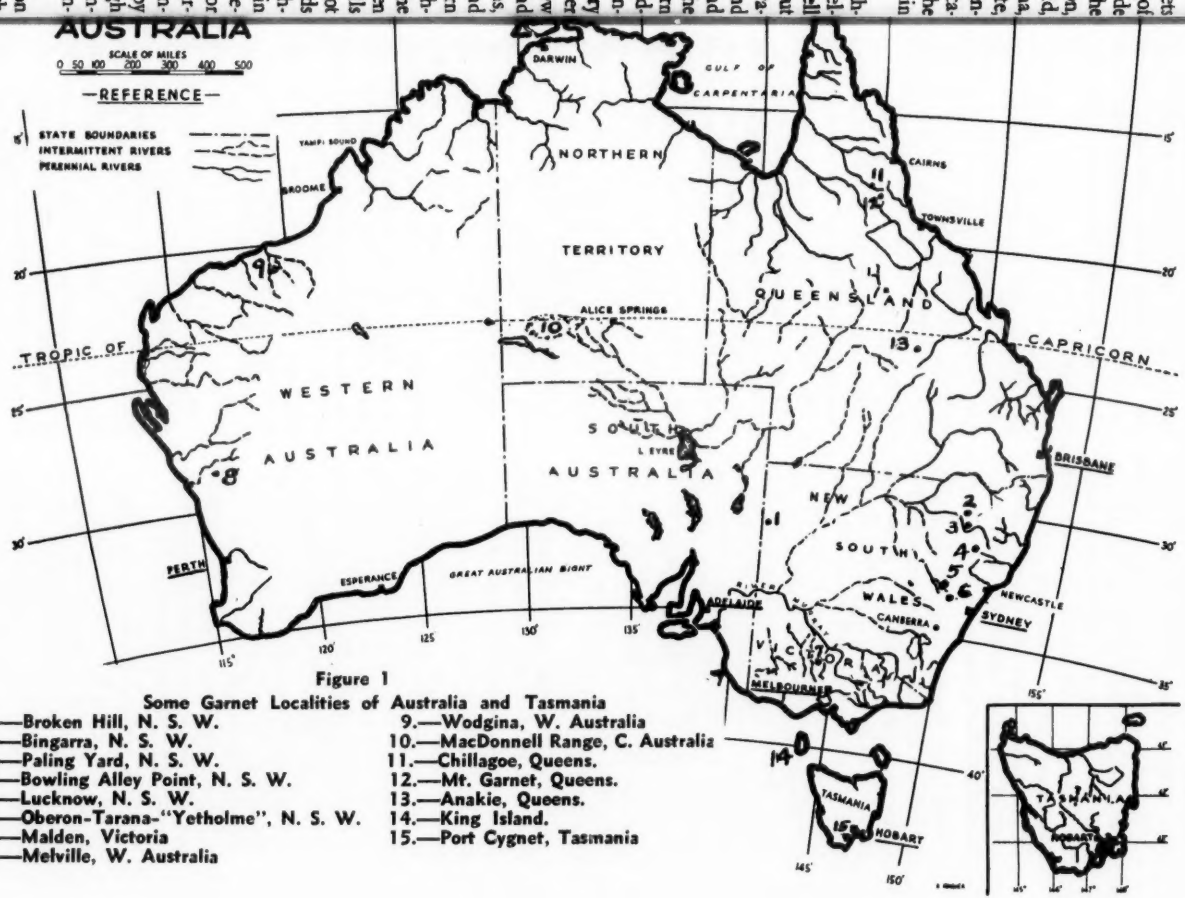


Figure 1

Some Garnet Localities of Australia and Tasmania

1.—Broken Hill, N. S. W.
2.—Bingarra, N. S. W.
3.—Paling Yard, N. S. W.
4.—Bowling Alley Point, N. S. W.
5.—Lucknow, N. S. W.
6.—Oberon-Tarana-"Yetholme", N. S. W.
7.—Malden, Victoria
8.—Melville, W. Australia
9.—Wodgina, W. Australia
10.—MacDonnell Range, C. Australia
11.—Chillagoe, Queens.
12.—Mt. Garnet, Queens.
13.—Anakie, Queens.
14.—King Island.
15.—Port Cygnet, Tasmania

was made, the southern part of the Northern Territory has been made into the state of Central Australia.

The area of Australia is a little under three million square miles or almost as large as the United States but with twice the coastline, including Tasmania. Most Australians live near the east and southeast coasts where the land is rich and well watered and the developed mineral resources are the largest.

The Great Plateau is in the west with an average altitude of one thousand feet above sea level and extending over 54% of the continent. The central basin includes large artesian well areas. The rich Murray and Darling River basins are in the southeast. The main feature of the east is the Great Dividing Range roughly following the coast line for fifteen hundred miles, averaging 150 miles in width, including the highest peak, Mt. Kosciusko, and the New England Range where there are many garnet localities. It slopes gradually to the west and abruptly to the east. Most of the people live between it and the coast.

Off the east coast is the famous Great Barrier Reef, twelve hundred miles long and thirty to seventy-five miles wide.

The southeast highlands consist mainly of the New England Range, the Blue Mountains and the Australian Alps and terminate in the highlands of Victoria. The well-known Broken Hill District in the Barrier Range in western New South Wales is Precambrian.

The interior desert region is a culminating expression of aridity, a limitless, slightly undulating surface, broken here and there by low ridges, strewn with rock fragments and with sparse vegetation, mainly spinifex grass.

On the eastern border of the Great Plateau are east-west ridges including the MacDonnell, Harts, Jervois and Strangways Ranges of Central Australia where garnets are found.

In South Australia is Lake Eyre, the largest in the country, thirty-five feet below sea level and saline. There are many lakes and rivers without outlets. The Murray River in the southwest is the largest in Australia, 1500 miles long and only 1½% of its water reaches the sea. Several short rivers on the west coast rise in the Darling Range and empty into the Indian Ocean.

The eastern mountains (the Great Dividing Range) are mainly Palaeozoic beds with large Carboniferous areas of sediments and granite. In the neighborhood of Sydney in New South Wales and of Ipswich in Queensland are large areas of Mesozoic beds.

The Darling Range in Western Australia is mostly Precambrian.

The interior is intruded irregularly with granite including many, if not most, of the low hills, such as the McDonnell Ranges in Central Australia, breaking through the Tertiary and Cretaceous beds.

The interiors of Queensland and New South Wales are underlain mainly by Mesozoic beds. The interior of Western Australia and South Australia is covered partly by Tertiary formations with considerable development of laterites, caliche and silicious cappings.

Tasmania, the island state, is composed mainly of Palaeozoic strata and dolomite.

There are no active volcanos in Australia but there are several areas of extinct volcanos in Queensland, New South Wales, Victoria and South Australia. In New South Wales and Victoria there were numerous outflows of basalt through low vents in Tertiary times; and in South Australia is the well known volcanic group of which Mount Gambier is the central figure.

The four hundred odd garnet localities are all over the continent except the desert region in the central portion and the tropical regions in the north. The occurrences described below are those mentioned as important or good in scientific and official publications and in personal letters from museum curators, Mr. Mawby and other individuals. In addition are described some more which interested the writer for various reasons.

Barrier Range-Broken Hill and Other Localities in New South Wales

The Barrier Range sprawls along the western border of New South Wales for about two hundred miles; so called because it formed a barrier against the unknown beyond to the early settlers and mineral prospectors. The country rock is Pre-Cambrian. At the southern end of the range is one of the best garnet areas in Australia, generally referred to as the Broken Hill District in Yancowinna County; the others being the Oberon-Tarana-Yetholme district, Lucknow in New South Wales, Wodgina in the northern district of Western Australia, King Island in Bass Strait between Australia and Tasmania and Alice Springs in Central Australia.

Broken Hill is the most fully described of all Australian mineral fields in the various reports and is well known to American collectors and mineralogists. It is in active operation for its silver, lead and zinc.

The best garnets at Broken Hill are spessartite which at the shallow levels of the lead lode are enclosed in galena and cerussite, often with embolite. They are reddish to light brown. In the lower levels, when free of cracks, they are a rich reddish brown and rose red, but only the smaller crystals are of gem quality showing the color of hyacinth. When enclosed entirely in galena, they are superior in quality and form. The crystals are trapezohedrons and dodecahedrons, modified by trapezohedrons and many measure up to an inch in size and in groups (See Figure 2).

Galena as an associate of garnet is uncommon and is apparently responsible for the excellent crystal forms. The spessartite, the manganese garnet which occurs in a lead lode, is explained in the official reports as a residual of the country rock after its replacement by the lode, but this theory was later questioned.

The lode is saddle shaped (See Figure 3) and is in fissures due to conditions in the surrounding gneiss. Whether it was originally a bed or a vein has not been definitely determined.

Among the other associates are rhodonite in fine crystals, bustamite, gray and pink fluorite, marmatite, calcite, pyrrhotite, pyrite, tetrahedrite, chalcopyrite and apatite.

Also at Broken Hill (proper) has been found gemmy almandite, grossularite (var. essonite), andradite crystals up to three quarters of an inch and a mixture of three of the varieties of andradite, namely aplome, colophonite and melanite in crystalline and granular masses of great size.

Broken Hill garnets are in most of the Australian and many of the American Museums. The writer's specimens are second rate.

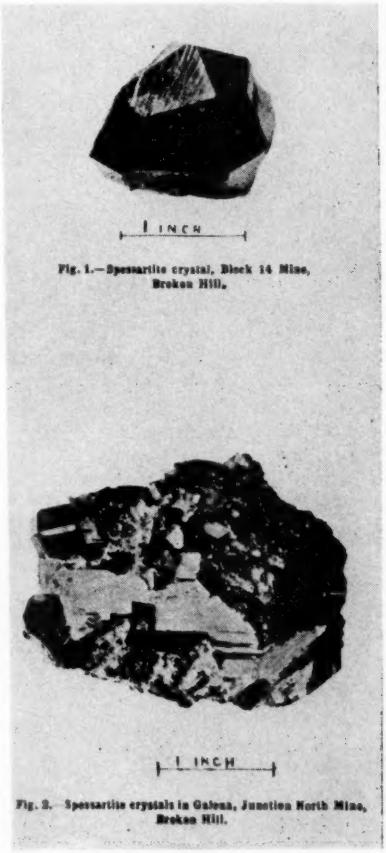


Fig. 1.—Spessartite crystal, Block 14 Mine, Broken Hill.

Fig. 2.—Spessartite crystals in Galena, Junction North Mine, Broken Hill.

Figure 2

Other garnet localities in the general Broken Hill district but still in the Barrier Range are Acacia Dam, the Pinnacles, Euriowie, Poolamacca, Silverton, Thackaringa and Umberumberka.

At Acacia Dam the garnets are more or less perfect dark red crystals, (probably almandite) in calcite with hornblende and in mica schists associated with cerargyrite and galena.

The writer's two specimens from near the Pinnacles are loose almandite dodecahedrons modified by the trapezohedron, dark red, pink in transmitted light and deeply etched on all sides, one an intergrowth and the other flattened. They are reported to be found in shallow water courses and according to the Museum at Canberra are considered as important.

The same museum also calls the almandite from Poolamacca important—commercially "important", that is. It is found in sands in certain creeks and when cut makes fine gems with a good color.

In the Silver Crest Mine at Silverton, a rose colored opaque garnet (probably almandite) coated with cerargyrite and embolite has been found, a specimen of which is in the museum at Sydney. Silver is an unusual associate of garnet. The museum at Victoria has almandite found in alluvial deposits in the vicinity. Good andradite has also been found here.

At Thackaringa have been found almandite and grossularite in the basic vein and andradite crystals up to one and a half inch, associated with large crystals of staurolite. The museums at Sydney and Melbourne have specimens of the almandite and andradite.

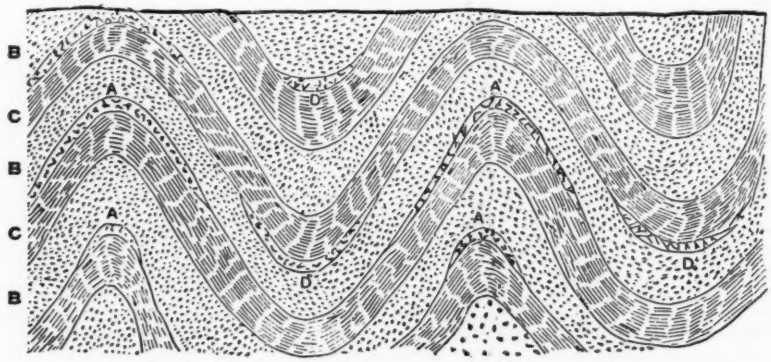
Umberumberka (what a name!), a silver field, has supplied both almandite and grossularite but there are no details. The surveys explain the occurrence as the result of an earth movement.

At Euriowie, detrital garnet (specie undetermined) and cassiterite occur in alluvial creek concentrations.

Lucknow and Other Uvarovite Localities In New South Wales

Lucknow is a small mining center about six miles south-east of Orange, a town on the Western Railway, 192 miles west of Sydney, New South Wales. Gold was discovered here in the Eighteen Fifties. A legend is that the prospectors who first found the gold exclaimed "we are in luck now" and so Lucknow got its name. It is noted, of course, for its gold and also among collectors for its rare and beautiful emerald-green uvarovite.

The uvarovite was found in four mines, the Great Wentworth, the Perseverance, the Phoenix and the Reform in decomposed siliceous-ferruginous material at surface level and in washings from which



A—Saddle reefs. B—Sandstone. C—Slate. D—Inverted saddles.

Figure 3

Saddle Shaped lode at Broken Hill

it was panned out as undamaged small dodecahedrons.

At the lower levels of the reef at sixty, one hundred and thirty and two hundred feet, the uvarovite is *in situ* disseminated through massive quartz which is unusual. At only three other world localities is it in quartz. Usually it is on chromite.

The general geological maps of Lucknow in the surveys of New South Wales show a Tertiary series consisting of quartzites, conglomerates, altered glacial fill, slates and limestone. These were penetrated by a Tertiary lava flow of serpentine and hornblende and at its contact lies the gold bearing reef. The serpentine is Palaeozoic and the slates are Silurian. The older rocks are generally observed by the extensive flow of basalt.

A thin section of this reef, streaked with uvarovite, has been examined by Dr. S. J. Shand of Columbia University who reported as follows: "In addition to the uvarovite, the chief mineral in your specimen is white quartz, mixed with which is a patchy fibrous stuff giving no sufficient characteristic for identification under the microscope but which possibly is tremolite. The black octahedral grains are apparently a chrome-spinel. It is a queer association of minerals."

It is a disappointment that the section examined by Dr. Shand contained no gold, but the association of gold and uvarovite with quartz *in situ* at Lucknow is otherwise authenticated. Associates are hornblende, serpentine and calcite.

Mr. R. O. Chalmers, mineralogist at the Australian Museum at Sydney, examined the section and was struck by the strong anomalous double refraction of the uvarovite which showed the typical regular arrangement in sectors very well. In places, "hour-glass' structure was clearly noted.

Dr. Lester W. Strock of Saratoga has examined pure uvarovite from Lucknow and estimates the chromite content about eight percent. This is a little higher than at Orford, Canada, but much less than Saranovskaya in Russia and Outokumpu in Finland.

Chromite is not reported from Lucknow, but it is reported in quantities at other points in New South Wales.

There are only a few specimens of uvarovite from Lucknow in this country, and it is unlikely that there will be more because the mines have been closed for twenty years. The National Museum in Washington, the American Museum in New York, the Harvard Museum in Cambridge, Mass., and perhaps five collectors, including the writer, have specimens from Lucknow.

There are only four other uvarovite occurrences in Australia and all are in New South Wales. At Bowling Alley Point, near Nundle, in the Tamworth district, uvarovite has been found as a green encrustation on chromite. On the Nogrigar Creek, a tributory of the Clarence River, in the New England Range of the Great Dividing Range, in northeastern New South Wales, it also coats chromite. The slickensided uvarovite at Paling Yard, fourteen miles northeast of Barraba, also in the New England Range, analyzes high in chromium content (21½%). It is associated with periclase which is accounted for by serpentine fissures in the chromite.

Specimens from Lucknow, Bowling Alley Point, Nogrigar Creek and Paling Yard (Barraba) are in the Australian Museum at Sydney. Specimens from Paling Yard near Barraba are in the Simpson collection at Perth and in the British and Chicago Museums.

But the uvarovite from Lucknow is the best from any of these localities because of the rich color and perfect form of the crystals which make beautiful micro-mounts.

MacDonnell Ranges - Alice Springs In Central Australia

Central Australia is a recently formed state, formerly the southern part of the Northern Territory. Across the middle of it lies the MacDonnell Ranges running west-east, bending at Alice Springs to the northeast and sub-divided into the Strangways, Harts and Jervois Ranges. The "Alice Springs" garnets of the older records actually came from these ranges

many miles away. This kind of reporting is quite common in Australia. The town was an air base in World War Two, but now has its normal population of only about six hundred.

On the Hale and Maud River in the Strangways Range about fifty miles north and northeast of Alice Springs both almandite and pyrope have been found in alluvial deposits and the former *in situ* in hanging walls of quartz. Specimens are in the Sydney, Melbourne and Perth museums. The almandite is described as first class gem material.

An interesting account of a mineralogical expedition from Brisbane in Queensland to Alice Springs in Central Australia appears in the Records of The Australian Museum (1932). Flattened crystals similar to those from Spruce Pine, North Carolina, and Avondale, Pennsylvania, were found in mica in a mica mine on Plenty Creek in the Jervois Range. Like the American ones, they are red and brownish red, many are perfectly clear and some measure up to three quarters of an inch in size (Figure 4).

In alluvial deposits near the same mine were found almandite crystals up to one and three quarter inches in size in the rather rare form of a combination of dodecahedron, trapezohedron and hexoctahedron. Though they are black on the surface, they are a very dark red in fresh fractures. The National Museum at Victoria has two specimens.

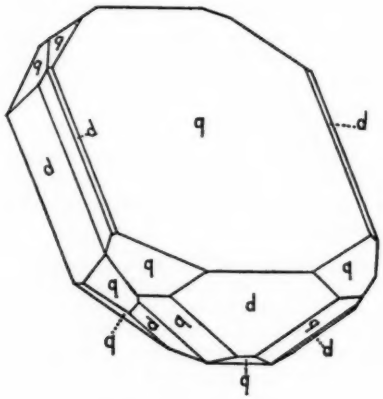


Figure 4

Flattened Garnet Crystal in Mica from Plenty Creek in the Jervois Range in Central Australia

The last of the sub-divisions of the MacDonnell Ranges, two hundred miles northeast of Alice Springs, is Harts Range which is frequently mentioned for its garnet occurrences in official reports and especially for almandite which is described as "in great profusion." They are good crystals and show both trapezohedrons and dodecahedrons, but most are distorted and in fragments and rounded forms. They are gemmy only in restricted areas. Cut and polished stones show great brilliance and are remarkably clear and free of flaws and imperfections. They are a deep wine color which passes in some stones into bright red and purple. When first discovered they were called "Australian ruby" just as the pyrope from South Africa was at first called "African ruby." In both cases, the wish must have been the father of the thought. You can picture the prospectors throwing them aside when they learned they were only garnets. Specimens are in the Sydney and Perth museums.

The writer has some fragments from an old collection labeled Alice Springs which he suspects are from Harts Range. A very pretty gem has been cut from one piece and another one was sent to Bohemia for cutting over a year ago but has not been heard from since. It has probably been seized by some Soviet official, believing it to be a ruby.

Brown crystals of grossularite have also been found in Harts Range.

The writer has some good loose specimens of pyrope from an old American collection labeled from "McDonald, South Australia" which have been identified as from the MacDonnell Range in Central Australia and which were probably found at the time of the so-called "Ruby Rush" when this territory was a part of South Australia.

(To Be Continued)

EXPEDITION TO MT. APATITE, MAINE

By CONSTANCE P. TROTT
36 Mt. Vernon St., Gardiner, Maine

Less than ten years ago Mt. Apatite in Minot, subject of various writeups on the well-known Maine tourmaline, was judged to have yielded its last gifts of any importance to collectors.

However in August, 1949, the daring Strout-Trott expedition to this little mountain exploded (to a small extent) such a theory, and made Mt. Apatite a beckoning finger of romance—to two ardent collectors at least.

I say daring; for these two adventurous ladies stormed the mountain alone, armed with nothing more formidable than flashlights and a camera; and spent two days and two nights with only the sky for a roof.

I, being one of these two explorers, and not feeling quite important enough to use the editorial "we", would like to continue the tale in my own slaphappy but enthusiastic way.

At three o'clock on a Friday afternoon late in August we were conveyed to our destination by the obliging president of our local mineral club, accompanied by his just-as-obliging wife. Our equipment, consisting of mineral hammers, chisels, spades, and a garden trowel, provisions, sleeping bags and crammed suitcases quite filled the baggage compartment, and appeared adequate, our noble president mournfully remarked, for a month's stay. But we weren't taking any chances, and refused to leave one item behind—not even an apple pie, which for some reason our conductor believed was not necessary to our happiness.

Proceeding to Lewiston we crossed the Androscoggin River into Auburn, and turning left followed the road to South Lewiston, where we took Route 11-121 west toward Minot. Two or three miles along this road a right turn took us past a U. S. Rifle Range and straight up the hill into the quarry where we were to spend the weekend.

I mention the Range because it was responsible for a great harrowing of our feelings before our return.

The four of us dug around for awhile in a small feldspar dump, where almost immediately a good omen in the shape of a piece of rose quartz was picked up, as well as small gemmy tourmaline fragments. Then, as it was getting late, the good people who had brought us felt that they must get started back; so dumping us and our possessions unceremoniously, our only protection departed. Not, however, without a few gruesome predictions which left me feeling more scared (if possible) than I had been. If it had not been for the casual air of unconcern exhibited by my companion in adventure, I should have screamed and run after the vanishing car.

Gripping my small ounce of pride and calling it courage, I shouldered as much luggage as I could carry, and loaded like oxen, my partner and I staggered to a likely spot across the trail from a quarry pit and beside the small feldspar dump, which Irene immediately named the "grout pile" and which became the nucleus of our wanderings for the next two days.

It was indeed a likely spot; if one can find such a thing around a quarry. Small pines and a birch and elm or two surrounded a grassy flat where we proceeded to pitch—not a tent, alas, but our sleeping bags! Apprehension seized me as I saw them lying there. And the sun sank lower in the sky!

We had brought no time pieces along. We figured that time would not be important here. We were both intelligent enough to know when we were hungry—and there was no likelihood of staying up too late. Not for me there wasn't, in that lonely place! Before the first star had popped out I was in my 6-foot sleeping bag and had zipped it up as far as it would go. And though I am five foot five, my feet were touching bottom.

It was a hot night. The sleeping bags were of a heavy water-repellent quilted material, with removable woolen linings. My companion sprawled comfortably on the outside of hers and commented on

the balmy evening air. I, the craven, who had refused to remove so much as my socks, clung desperately to all my coverings; and, cowering inside, melted slowly away.

A hot night, and a never ending one, shot with falling stars; and my comforting partner wondered aloud if any of them had our names on them.

Somewhere during its interminable reaches I must have closed one eye for an instant; for suddenly I realized that a small animal was running up one side of Irene and down the other. She laughed, and the scared little woodsman palpitated away into the night.

Morning came slowly, and the moment it was light enough to see we leaped out of our sleeping bags. I say we, though I was the only one who had been inside.

The sunrise made the quarry wall beautiful with rose and violet as we climbed down over the side. Frogs popped into the water and then popped up again to stare rudely as we used the pool for a bathtub.

Breakfast was a hurried affair, and then we attacked the "grout pile." Our implements were simple: ordinary garden "scratchers," excellent for the purpose, as they turned into view the smaller pieces. Fine specimens of cleavelandite were to be found; scattered lepidolite, massive and in small crystals, and very fine specimens of a curved variety of mica, glittering like metal—some even bronze in color. It looked so much like the shell of the fabled armadillo that we immediately called it "armadillo mica", and packed up several pieces to bring home.

One greatly appreciated find was a small feldspar crystal, about two inches long and an inch wide. It is odd that in our pegmatites a feldspar crystal entire is so rarely found.

And then I began turning up tourmaline.

I had brought six small match boxes fitted into a large one to hold small specimens. Tourmaline is the love of my life, and I search for the crystals wherever there is the slightest hope.

It is my unsanitary habit to pop all small pieces into my mouth for future reference, and I had acquired quite a mouthful before I thought of my boxes.

The tourmaline at first were all fragments; gemmy with an occasional clear green for variation. They were very tiny, but the only thing I needed to spur me on. I settled down to work.

Irene did some tourmaline hunting, but settled in favor of other specimens in which she was more interested. She attributed her lack of industry along the tourmaline line to her glasses, but after the bad time she had given me with her too vivid imagination the night before I was giving her no quarter. I dug ferociously, and by noon had made several good finds and could hardly tear myself away for dinner.

Shortly afterwards three boys came up to the quarry and proceeded to shoot at frogs in the pit; much to our discomfort and apprehension. They were very casual in taking aim, and took a ghoulish joy in striking the quarry wall. Irene stayed in the shade to dig, having a little more sense than I, and having also acquired a headache from too much sun in the morning. But I crouched doggedly in the sun with a wet handkerchief tied around my head; dodged imaginary bullets; and dug.

By mid-afternoon I had filled my six little boxes; five with gemmy and tiny gem fragments, and one with larger and pure gem material. One piece in particular which was later cut into a stone was ½ inch long and ½ inch in diameter. In all, about fifty grams of gem tourmaline, all green, were taken from old Mt. Apatite, supposedly worked out.

We would have been perfectly happy had it not been for our three belligerent visitors, who banged away all afternoon. When they finally left us we decided to our dismay that they had merely adjourned to the next quarry pit about a hundred and fifty feet down the line; for the noise kept on very near us till sundown, and still there were no sounds of departing motorcycle. This gave us another bad night. It was not until the next and last day that we realized the later volleys of shots had come from the rifle range below.

The second night was better than the first. We spent it climbing in and our of sleeping bags, for the temperature went

up and down. Once I turned over rather thrashily and a horrified little shriek and a scooting patter close at hand told me that another little wood creature had been surprised.

In the morning a family of chickadees shared our breakfast, while a myrtle warbler looked on from nearby. One of the younger chickadees swung on a twig and kept insisting that he was a "chickabeeby."

Queer how much one will drink on a camping trip. We had brought two gallon thermos jugs of water, a can of grapefruit juice, and two quart thermos bottles of coffee; yet by Sunday noon our liquid supply had given out.

Irene made a syrupy concoction of lemon juice and sugar, but when I tasted it it sneaked up into my ears. So I left her to her sticky pleasures and found a cool ledge where I stretched out to wait for our rescuers.

Our rescuers, by the way, very nearly didn't get to come. Due to the very dry condition of the Maine woods they were at first refused permission to enter. Only by a very clear statement of the case were they finally permitted to come and get us.

How nice they looked, the dear people! Bearing ice cream and cold drinks, they were a welcome sight indeed. And they made no complaint when we loaded the car down even more heavily than before. Indeed, they even wanted to go and pick up a few specimens themselves.

Hating the sight of the grout pile, we dragged reluctant feet after them. When we reached it, however, a spark of enthusiasm flared—and though I knew full well that I had moved that dump a spoonful at a time down to the path and back again, I picked up a flat stone and began again to dig.

We were glad to get home. We had had a rewarding weekend and a good time. But we had seen enough of Mt. Apatite for a while.

This trip, as it turned out, was only an appetizer. Already we are making plans for another weekend trip next summer. Where will it be? Noyes Mountain, perhaps; or maybe even Newry, that collector's paradise!

A HALITE OCCURRENCE IN MAINE

By PETER ZODAC

Editor, Rocks and Minerals

Near Seapoint, on Cutts Island, in southwestern Maine, is a long beach facing the Atlantic Ocean. The beach is very rocky, a beach shingle 100 feet wide and several thousand feet long shows no sand whatsoever and where the shingle terminates at both ends, diabase outcrops begin.

The locality was visited by the writer, together with Mr. and Mrs. Stephen Blake, of Kittery Point, Me., on Thursday June 23, 1949, in order to examine the pebbles on the beach. Many pebbles were collected and a report on them may appear later in *Rocks and Minerals*.

In examining the diabase outcrops, a thin glassy colorless crust coated the rock in many places and was especially noticeable in little depressions where it was thicker and crystalline. At first the crust had us puzzled but it soon dawned on us what it was and on tasting it our identification was verified. It was halite (common salt).

Waves would dash sea water over the rocks and during hot sunny days the water, that had collected in depressions, would evaporate precipitating its salt as a colorless crust. We tried to obtain samples of the rock showing the halite crust but without success, as the diabase was very tough and the halite never appeared on the edges of the rock but always in the flat areas where it was extremely difficult to get at.

The above beach is about 300 feet south of the main sandy beach (popular with bathers) at Seapoint and the locality is about 1½ miles east of the little town of Kittery Point in York County.

ARIZONA STATE FAIR MINERAL SHOW

Arizona held its fourth annual mineral show at the state fair, Phoenix, Ariz., November 4 to 13. Outstanding Arizona minerals were among those featured in the displays, which included those of collectors, miners and students.

Nineteen grade schools and many high school students exhibited. Beauty of specimen, arrangement and correct identification were nicely adhered to among the students. Arthur L. Flagg, superintendent of the mineral department, and president of the Mineralogical Society of Arizona, has worked untiringly during the past four years to encourage interest in the earth sciences among school children. One teacher observed how easily children become acquainted with minerals and their uses when once their interest is aroused.

First award on cabinet specimens went to Lower Miami School, Miami, Arizona, who won the Phelps Dodge trophy for the second successive year. Second, to Ajo School, Ajo; Third, to Miles School, Tucson. Honorable Mention, Sunnyside School, Tucson, Roosevelt School, Superior; Mansfield Junior High, Tucson.

High School students, cabinet specimens: First, Bobby Backstein, Sonora, Arizona; Second, Gordon Levine, Phoenix; Third, Harold R. Belsher, Phoenix; Honorable Mention, Ralph Gabbert, Phoenix.

High School students, thumbnails: First, Albert Lincoln; Second, Gordon Levine; Third, Melvin Sjoidin, all of Phoenix. Honorable Mention, Norman Godfrey, Ajo.

The Phelps Dodge exhibit illustrated scenes in the production of copper at its properties in Arizona. A lighting device spotted the ore as it was carried from the mine to various bins and mills, then to the furnaces and finally to the casting machine from where the anode copper is sent to the refinery. Phelps Dodge has seven mines throughout Arizona, New Mexico and Mexico; seven smelters; two refineries, one in New York state and one at El Paso; and four fabricating plants across the United States. About 44 products are manufactured by the corporation and its subsidiaries.

A dark room displayed fluorescent minerals under lamps owned by Ultra-Violet Products, Inc., of South Pasadena, Calif. The minerals were from the collection of Arthur L. Flagg, and represented Arizona, New Jersey, Canada, Austria, Norway and several other countries. A group of fine fluorescent gem stones were from the collection of Louis Loerzell of Phoenix.

Seven cases of unusual Arizona minerals were displayed by the Arizona Department of Mineral Resources, and one case of uranium ores, mostly from Arizona.

Another case housed a collection of spectacular uranium minerals belonging to Arthur L. Flagg, of Phoenix. Flagg, who is a mining engineer, has specimens from every country in the world producing uranium. One piece of Uraninite-Gummite was displayed beside an "autoradiograph" (photo) which it took of itself. The specimen came from the Ruggles mine, Grafton, N. H. There were three specimens, Andersonite, Bayleylite, and Swartzite, which are newly discovered minerals from some old workings in the Hillside mine, Yavapai county, Arizona. These have not been classified yet. Two more specimens from same mine, and one from Burro Creek, have not been named. Of the 200 known uranium ores, some of which are extremely rare, Flagg has 53, and is expecting 2 more from Europe; Dewindite and Uranotil, not produced in this country. Many of the ores in the exhibit contained colorful and rare crystals.

Representing early Arizona was a replica of an old arrastre, an ore grinding device, built by H. D. and Charles B. Richards, modern prospectors and guides, in front of the mineral building. The arrastre was operated by a water wheel. All during the fair the Richards brothers panned gold for crowds of interested spectators. With claims filed on every

available spot in front of the building, the fair association said maybe they had better get a quit claim deed from them before the fair was over.

Many of the old arrastres were horse-drawn, however. On display was a photograph taken in Mexico of one. Exhibited with it was a ball of amalgam of gold and silver milled from the ore crushed in the arrastre. Arthur L. Flagg acquired the exhibit while in Mexico in 1910.

Many of the individual exhibits were entered by members of the Mineralogical Society of Arizona, the Maricopa Lapidary Society, and friends and acquaintances of both societies.

Some of the unusual exhibits in the mineral department were: a group of staurolite crystals (fairy crosses), by Fred D. McDonald, Phoenix; a natural formation "shrine" of rhyolite set with a quartz crystal flower, found in the desert west of the Vulture mine, Arizona, by Sam Humphries, Cashion; 2 cabinets of crystals and horn silver, including rich specimens from the Globe area from which Apaches once made silver bullets, by Lee Boyer, Tempe; a group of fire opals in matrix and a group of gold crystals, by Arthur L. Flagg, Phoenix. Outstanding and colorful crystals of all combinations and patterns filled cases of those who drew awards and those who entered as noncompetitors.

The Maricopa Lapidary Society displayed their crafts in 12 cases of their own and several belonging to the mineral department. The exhibit included a wide variety of polished slabs, cabochons, handmade jewelry, faceted gems, and carved figures. Orville P. Sanderson, from the Associated Press in Phoenix, is president of the Society. They have been organized about two years and this was their first show, which was outstanding in beautiful workmanship and artistic displays.

Some of the unusual exhibits in lapidary art were: leaves carved from ricolite, by Edna F. Sanderson; an agate cabochon with natural mountain range, polished by Charles Miller, Phoenix; agate with natural flag on Iwo Jima, polished by J. L. Sumner, Phoenix; hand-made silver broaches, cactus and animals set with gem stones, made by Edna Curry, Scottsdale; gem stone birds and animals, by Ellis A. Johnson, Phoenix; a rockhound carved from ricolite by Ellis A. Johnson; and unusual moss agate slabs polished by Howard Van Horn, Tempe.

Awards won in all departments follow:

Adults, ten cabinet specimens: First, Richard W. Flagg, Miami, Arizona; Second, E. P. Matteson, Phoenix; Third, Curt M. Miller, Tempe; Honorable Mention, A. A. Tormohler, Tempe; Kathryn M. Miller, Tempe; C. Fred Burr, Phoenix.

Standard Box thumbnails: First, Richard W. Flagg, Miami; Second, Lee W. Kornegay, Miami; Third, C. Fred Burr, Phoenix.

Fifteen cabochons made by exhibitor; First, Richard W. Flagg, Miami; Second, Mabel Adin Richardson, Scottsdale; Third, Ellis A. Johnson, Phoenix; Honorable Mention, Howard Van Horne, Tempe and W. J. Polzin, Phoenix.

Five polished slabs made by exhibitor: First, Howard Van Horne, Tempe; Second, Richard W. Flagg, Miami; Third, Mabel Adin Richardson, Scottsdale.

Ten cabochons made by exhibitor, all one kind: First, Richard W. Flagg, Miami; Second, Olive Miller, Phoenix; Third, Mabel Adin Richardson, Scottsdale.

Five polished slabs, all one kind, made by exhibitor: First, Richard W. Flagg, Miami; Second, Howard Van Horne, Tempe.

Native Arizona stone, cut by exhibitor, mounted in setting made by exhibitor; First, Richard W. Flagg, Miami.

Native Arizona stone made by exhibitor, mounted in setting not made by exhibitor; First, Richard W. Flagg, Miami.

Jewelry made by exhibitor mounting stone not made by exhibitor: First, Ethel Genosa, Phoenix; Second, James E. Frape, Phoenix; Third, Mrs. Oscar Rengo, Phoenix; Honorable Mention, Edna Curry, Phoenix.

Faceted Stones made by exhibitor: First, Mabel Adin Richardson, Scottsdale;

Second, Martin Koning, Morristown.

Fancy shapes, including carving: First, Ellis A. Johnson, Phoenix; Second, Leslie Vance, Phoenix; Third, Edna F. Sanderson, Phoenix; Honorable Mention, Mabel Adin Richardson, Scottsdale.

IDA SMITH
Publicity Chairman
Mineralogical Society of Arizona
2010 W. Jefferson, Phoenix, Ariz.

WHAT ABOUT THE COLLECTOR-DEALER?

By A. BUSTED DEALER

It has been with considerable concern that some collectors have noted the folding up of business by many of those who have collected and sold mineral specimens during the past few years. It has been of even greater concern to some of us who have tried to earn our groceries by collecting and selling.

It is safe to say that except for a few localized collections there are no outstanding mineral collections which contain only specimens which were actually mined and collected by one person. Many localities are just too isolated and require too much preparation (and a good bit of luck) to make this possible.

We are all for the collector who likes to go out and collect his own (seems to us that's the urge that made us decide to go into business) but perhaps some collectors are apt to forget that a lot of dealers are not on pension or relief and just have to eat once in a while in order to be able to climb the hill.

No doubt there were a few insincere dealers in the business but the great majority went into it due to a sincere love of rocks and casting discretion to the wind decided to live with them. That is fine but to our sorrow we have found that very few rocks are edible. (A steady diet of halite is not very nourishing).

Just what is sportsmanlike about spending a half day trying to wrangle information on good localities out of a collector-dealer—the localities are probably too isolated to be reached by the average collector any way—and then leaving with thanks and a pat on the back, we don't know. We believe it's just unthoughtfulness, but we've even had requests for detailed information by mail in order that the "collector" wouldn't have to waste time by visiting our shop. These individuals are no doubt just not real collectors and are in the minority but the dealer finds that they take up about ninety percent of his time and each conference usually results in the sale of a 25¢ specimen (if that is the cheapest thing in the shop). Unfortunately the economy of "Life in these United States" is not based on an occasional 25¢ sale, even when we live it in the most conservative manner.

Now we hope the day comes when we can spend all our time collecting, trading, giving away and exchanging information but until our oil well comes in I'm afraid we'll just have to do something that some one believes is worth more than 7¢ per hour, in order to buy groceries.

On second thought I'm afraid everything above the 7¢ will go to buy mineral specimens for our own collection any way. The confirmed collector just can't win—anything but rocks, that is,—so what's the use.

In any event let's give a little thought to the fellow who blows out his tires, wrecks the old jalopy and then walks the last five miles to get something particularly good for his customers. If he makes the "minimum wage" above his expenses he is very lucky, while we talk glibly of "raising the living standard", etc. We say "Oh, well, he just *found* the rocks any way so if we can chisel him out of one he isn't losing anything."

Many beautiful collections have been built during the past few years, principally due to the work of the collector-dealer. When made by a discriminating collector these collections have a value far above the cost of the specimens purchased. Why not give the guy who did the rugged part of the work a break?

FULGURITE HUNTER MAKES "KILLING"

By MAYME MYERS
Mears, Michigan

In Michigan a young man has made a name for himself as a Fulgurite Hunter. All the ammunition needed is a good pair of strong legs, quick seeing eyes and determination. Just in case there is a question as to what a Fulgurite is, an explanation is in order.

When the lightning strikes the vast Oceana County, Michigan, Sand Dunes, it fuses the sand into glass tubes. These go down into the sand many feet. These are located by the color of the sand or at times pieces of the glass are laying on the top of the sand. According to Westinghouse Laboratory it takes over 3000 volts of hot lightning to make a fulgurite. You will always find them with a glazed hole through them and usually rough on the outside. However there are many different types of finish and it is always interesting to note the various conditions.

Recently Pete Wood, who has been finding these for several years, was able through very precise work to excavate one that is thirteen feet long. When asked how he managed to get down that far in the sand, he said that the hole he dug was about 5' x 7' across the top and he had to almost pick each grain of sand away from the specimen in order to get it out. He had heard that as they go down into the sand they get smaller but in the distance that he was able to go it retained the same size. However it is impossible to obtain the fulgurite in one piece as they break very easily.

There have been stories through the Associated Press releases besides numerous other articles and pictures of Pete the Fulgurite Hunter, therefore he has sold same to many people throughout the States. Also colleges are most interested in these formations. Also collectors of

(*Continued on Page* 71)

Pete Wood, of Mears, Mich., digging out Fulgurites. His finger points to a long slender, slightly bent Fulgurite exposed in the hole.

NEWARK SOCIETY VISITS FRANKLIN, N. J.

By PETER ZODAC
Peekskill, N. Y.

On Sunday, November 13, 1949, the Newark Mineralogical Society, of Newark N. J., held its annual field trip to the world famous zinc mines at Franklin, N. J. The group met at a common meeting place early in the morning from which point they proceeded to the Buckwheat Mine in Franklin whose large dump kept the collectors busy for a number of hours.

Mr. Mark Robinson, of New Orleans, La., and New York City, had called on me Friday, November 11th (Armistice Day) and learning of the field trip expressed a desire to take it in as he had never been to Franklin.

"If you will call for me Sunday at 10:00 a.m.," I told him, "we will both go and have a good time."

It was exactly 9:30 a.m. Sunday, when the front door bell was rung by Mr. Robinson and within a few minutes we were off.

We headed westward from Peekskill, crossed the Hudson River via the Bear Mountain Bridge, went through the beautiful Bear Mountain Park (saw 3 deer here), up over the Ramapo Mountains, crossed Greenwood Lake Valley, up over Mt. Peter, and in Warwick, N. Y., we turned left and headed southward for New Jersey and Franklin.

When we reached the Ramapos it began to drizzle and by the time Franklin was reached it was raining lightly. It was 12:00 noon when we pulled into the parking space at the Buckwheat Mine where many cars were parked. Right in front of us was the dump, and looking down to its base, collectors were seen everywhere, all busily engaged in collecting nice specimens.

"Hurry up!" one of them called to us as we got down near them, "we just found some nice rhodonite and some may still be available for you." He pointed in the direction where we saw a couple dozen collectors working on the slope of the dump. We headed for the spot. One good-looking fellow seemed to be in charge of the group. He was Louis Reamer, the Secretary of the Club and one of the most popular collectors in the metropolitan area of New York City.

"You can't have any of our nice rhodonite," was his greeting on spotting me, unless you admit *Rocks and Minerals* is better than you are."

"Of course it is," Mr. Robinson almost yelled out in my defense, "that's why we all take it."

"In that case here is a specimen for you," and he handed me a beautiful rhodonite.

"Here is another for you," called out Vincent Giordano, "because I like *Rocks and Minerals,* too."

Mr. Robinson got some specimens also but I never checked up on them. They might have been better than mine!!! There was plenty of rhodonite here and we all collected some beautiful specimens. The rhodonite at Franklin is zinciferous and is also known as fowlerite. There was also some fairly nice epidote here and I picked one up.

"Throw that away," said a young lady standing near us, "come with me and I will show you where you can get some good stuff."

We walked a short distance and a huge mass of good green epidote was shown me.

"How will I ever break a specimen off that big "boulder" with my little Estwink hammer," I muttered to myself in a fairly loud tone.

"Stand aside," said a cheery voice, "and let me break some off for you."

A husky young fellow then started swinging a sledge hammer against the big mass and in no time at all many fine specimens of all sizes were strewn over the ground. The hammering attracted other collectors so that there were at least a dozen of us picking up the nice epidote. Most of the epidote was veined in red and some of the collectors said it would make lovely cabochons. Epidote takes a good polish and is especially beautiful

when veined in red. Many small but good quality gem specimens were picked up by collectors for polishing.

Having filled up on epidote, we were just about to head towards a good size rock pile when Albert S. White, President of the Society and Leader of the field trip, approached us.

"Have you collected any fluorescent willemite?" he asked me. On being answered in the negative he continued, "Come with me and I will show you where it can be found."

We followed him for some distance and among many huge masses of limestone was the willemite. Here Mr. Robinson and I collected some very fine specimens which occurred as greenish grains in white calcite.

"Look at the red in this franklinite," Mr. Robinson called out to me as he hefted a large specimen at this willemite locality.

"Why, it is zincite!" I answered in surprise, "I wonder if there is any more of it." So I started searching and in a short time dug up many interesting specimens from the dump. It was a novelty to me, this finding of zincite. I have been to Franklin many times but this was the first time that I found zincite. The mineral occurred as thin red bands and small masses in the black franklinite.

All too soon it was 2:00 p.m., and we were hungry so collecting stopped, as we trudged wearily toward the car, for our bags were heavy with minerals and we were "weak" from hunger. We headed for a diner in Franklin, on N. J. 23, where after a good meal we felt stronger and better.

The fine rain had been falling continuously, but by now it was quite heavy. On reaching the Buckwheat dump we were in a way amazed to find that all cars had disappeared and not a collector was in sight. In a way we were not too surprised as the weather by now was most disagreeable. Just as we were about to pull out and head for home, we had enough specimens, a car drove in and out stepped Mr. White.

"We were looking for you," he told us on reaching our car, "come on and join us. We are all in the Franklin Quarry where norbergite, fluorite, and graphite is being found."

We followed him to the quarry (about 500 feet away, southeasterly) where the collectors were all out in force, regardless of the heavy rain. One group had found purple fluorite in a corner of the quarry and were busily collecting it.

"Did you get any norbergite?" a well known voice spoke in my ear. I looked around and there stood Edwin Skidmore. He had arrived only a few minutes ago, he told me, and this is why I hadn't seen him before.

He led us to a spot in the quarry where norbergite was very plentiful. The mineral occurred as brownish grains in white crystalline limestone. Mr. Skidmore had a sledge hammer and he was soon breaking out nice specimens for us.

We spent about 15 or 20 minutes at the norbergite locality and then it really started raining heavily and we decided to call it quits, as by now most of the collectors had also left. We headed for the car, stopping on the way at the fluorite locality where we picked up a few fair specimens. Bidding Mr. White and the few remaining collectors good bye, we got into the car, and drove off for home.

Although the day was very unpleasant, due to the continuous rain, the collecting was most enjoyable and we both had a good time. The members of the Newark Mineralogical Society are most friendly, courteous, and agreeable and many of them went out of their way to make sure we got good specimens. All these many courtesies and friendly acts made a deep impression on Mr. Robinson who on the return journey kept saying over and over again, "It was a most enjoyable day. I am glad I was there. The members of the Newark Mineralogical Society made things very pleasant for us, too."

There were 33 members present (and one guest—Mr. Robinson) who came in 23 cars. Mr. White, president of the Society was also the leader of the group. As may be surmized, I am also a member of the Society.

Minerals Collected At Franklin

Among the minerals found by us at Franklin, N. J., during the field trip were:

AMAZONSTONE

This is the green variety of microline and it is quite common on the Buckwheat dump where it is found as greenish crystalline masses associated chiefly with smoky quartz. The amazonstone is often found in large masses which are difficult to break; the mineral does not occur in large cleavages or in a deep green color so that it would make a good gem stone. Some large and nicely formed crystals of amazonstone have been found at Franklin but we never found any.

APATITE

Tiny rounded bluish green crystals embedded in metalcoated calcite were found at the Buckwheat dump.

CALCITE

This mineral is very common on the Buckwheat dump where it is found in large cleavable white, gray and pinkish masses, whitish crystalline masses, and also in large cleavable to coarse crystalline brownish (metalcoated) masses. The name "metalcoated" was given to the brown calcite by James F. Morton, a former curator of Paterson Museum; this is a manganiferous variety of calcite, generally pink in color, which on exposure to the sunlight becomes brown and even black. Practically all Franklin calcite fluoresce pink or red—some deep red—under the ultra-violet light.

EPIDOTE

Green, massive, and associated with quartz and reddish feldspar (microcline) was found on the Buckwheat dump as has already been mentioned.

FLUORITE

Found in the Franklin limestone quarry as deep purple crystal masses in a tough dark grey fine crystalline limestone. Tiny pyrite crystals were associated with the fluorite.

FOWLERITE

This is a variety of rhodonite. Rhodonite is a manganese silicate but the mineral occurring at Franklin is zinciferous with considerable amounts of calcium, iron and magnesium and the name fowlerite has been given it. The name fowlerite was given to this rhodonite back in 1822 by Thomas Nuttall in honor of Dr. Samuel Fowler, an eminent physician and mineralogist of that period and who owned the Franklin mines; unfortunately Dr. Fowler did not realize the value of his huge ore deposit.

Fowlerite is pinkish in color and all specimens that we found on the Buckwheat dump were associated with franklinite and in many cases with white calcite; some of the specimens were extremely beautiful.

FRANKLINITE

This is an iron, manganese, zinc oxide, iron-black in color, which received its name from Franklin, N. J., where it was first found many years ago. It is very common, resembles magnetite in appearance, and is found associated with many minerals but chiefly calcite, willemite, and zincite. It occurs in granular masses, often large and quite pure, or as tiny rounded crystals in calcite, etc. When large franklinite masses are hammered, the mineral often crumbles easily. The mineral is especially attractive when it is banded with green willemite and red zincite. Sometimes franklinite is found in a tarnished condition which make beautiful specimens. Some fine crystals of franklinite, often large, have been found at Franklin.

GRAPHITE

Tiny lustrous black flakes occur associated with norbergite in the Franklin quarry.

GREENOCKITE

The rarest mineral collected at the Buckwheat dump was greenockite which occurred as lemon-yellow powdery incrustation on dark green serpentine. The mineral was not noted until a few days later—when the minerals collected were being examined—or I might have had a larger and better specimen and perhaps a number of them as the one obtained showed it had been broken off a large mass.

Greenockite is cadmium sulfide and is one of the rarer minerals to occur at Franklin. Judging by specimens seen in other collections which vary from chips up to 1 x 1" in size, my 2 x 3" specimen

is a fairly good one, and yet it is poor when compared with greenockite from Friedensville, Penn.

NORBERGITE

This is a basic fluo-silicate of magnesium first found at Norberg, Sweden, which locality gave it its name. At the Franklin limestone quarry, norbergite occurs as brownish grains in white crystalline limestone and associated chiefly with graphite, but at times with tiny grains of pyrite, small masses of pyrrhotite, small masses of purple fluorite, and with small plates of phlogopite. The norbergite, with its associated minerals, appeared in the limestone wall as a band, possibly 2 feet thick, dipping gently southward.

A large slab of white limestone sprinkled with the brownish norbergite makes a very attractive specimen.

PHLOGOPITE

This is a bronzy variety of mica which has been found at Franklin in most attractive specimens. I have in my collection good sharp crystals of phlogopite, 1 inch in diameter, embedded in white crystalline calcite; one large crystal has embedded in it a tiny crystal of phlogopite.

The only phlogopite that we collected came from the Franklin quarry but the specimens were not very good due mainly to the fact that we were not looking for it and the heavy rain prevented too much collecting. The phlogopite occurred as pale bronzy small crystals in limestone. In one specimen collected, I noticed tiny masses of purple fluorite associated with phlogopite.

PYRITE

Found as small grains with norbergite in limestone.

PYRRHOTITE

Found as small masses with norbergite in limestone.

POLYADELPHITE

This is a massive brownish-yellow variety of andradite (garnet) which was first found at Franklin, N. J., by Prof. Thomas Nuttall in 1822. Prof. Nuttall sent a specimen to Dr. Thomas Thomson who in 1829 analyzed, described, and named it polyadelphite, from the Greek for brother, because the mineral consists of 5 different silicates united.

At Franklin, polyadelphite is a common mineral on the Buckwheat dump and it may be found in large masses associated chiefly with franklinite. When in good quality, polyadelphite makes attractive specimens.

SPHALERITE

Noted as brownish crystal masses associated with fluorite in the dark gray limestone in the Franklin quarry.

WILLEMITE

This is a zinc silicate and is a valuable zinc ore at Franklin, N. J., and generally it is greenish in color but yellow, red, white, black, brown, and other colors are known. The willemite of Franklin is especially famous for its brilliant green fluorescence under the ultra-violet light. On the Buckwheat dump we found yellowish and greenish grains of willemite in white crystalline calcite and these when placed under the ultra-violet light looked very beautiful—the grains fluorescing brilliant green and the calcite deep pink. Franklinite, as small rounded crystals, were associated with every willemite found; only one willemite specimen showed zincite which occurred as tiny red grains.

Lardner Vanuxen and W. H. Keating in 1824 gave the first description of this mineral but called it a "silicate of zinc." Later it was renamed willemite to agree with the willemite named by A. Michel-Levy for the mineral found in the zinc mines of Vielle Montagne, Belgium, which had been named after William I. King of the Netherlands.

ZINCITE

This is a red oxide of zinc which was first found in Franklin, N. J. It was first noticed, described and analyzed by Dr. Archibald Bruce, in 1810, who named the mineral, "red oxide of zinc." In 1845 William Haidinger renamed it zincite by which name the mineral is now known.

The zincite that we found on the Buckwheat dump was deep red in color and occurred as granular masses with franklinite and in some cases also with a little white calcite. When found banded with franklinite and willemite, it often forms attractive specimens, such as are seen in many museums.

SOME OBSERVATIONS ON A SOJOURN THRU EUROPE (Part 1)

By JOEL MARTIN HALPERN

The following is a brief account of my four months' journey through Europe, with special reference to various geological phenomena observed. However, I shall not confine myself exclusively to geology since occasionally it is beneficial to digress because the sciences of geology and mineralogy are so intimately bound up with human affairs. Often when observations are presented in a somewhat subjective vein they are more meaningful and more interesting even if less accurate than when presented from a purely scientific standpoint.

I left my home in New York the first week in June, 1949, travelling by train and thumb to Quebec City, Quebec, Canada. From Quebec we sailed on the Cunard White Star Liner, Samaria, and after a somewhat rough crossing of 8 days we docked in Tillbury near London, England. Of course on the last leg of our voyage we didn't miss seeing the world famed "White Cliffs of Dover." Actually these chalk cliffs are found on both sides of the channel and are not limited to the vicinity of the city of Dover. These deposits consist of soft, white, friable rock composed of what were once shells and fragments of foraminifera. Extensive beds are found over northern France and Belgium and the south and east of England. These beds were once continuous across the Channel and over much of the North Sea, while at the same time they extended as far to the northwest as northern Ireland. Cliffs which are now present to the sea are a result of subsequent erosion. Flints in the chalk are the result of secondary segregation of silica which originally was scattered thru it, and which originated from the silicious skeletons or other parts of marine organisms. The late Albert Charles Seward, the famous English paleobotanist, in one of his books described the origin and structure of these deposits. In this work he discussed a series of fossil "sea-urchins" found in these cliffs that could be used as index fossils. That is, it was possible to tell the age of a particular sedimentary chalk deposit by the type of fossil sea-urchins you found there.

From Tillbury it's only a short train ride to the heart of London. I spent several days there seeing all the sights that every tourist in London for the first time "must see." One of the most interesting was Marble Arch in Hyde Park where speakers air their views on every conceivable subject. Then by train to Folkestone and by ferry to Calais in France. Since this was my first trip to Europe anything that differed from my previous experience was of great interest to me. Calais is in very bad shape. The whole harbor area has been badly damaged and is now only partially rebuilt. I cycled thru northern France to Rheims and from there took a train to Strasbourg. A short stop there during which time I crossed over into Germany very briefly, then over the border to Basel in Switzerland.

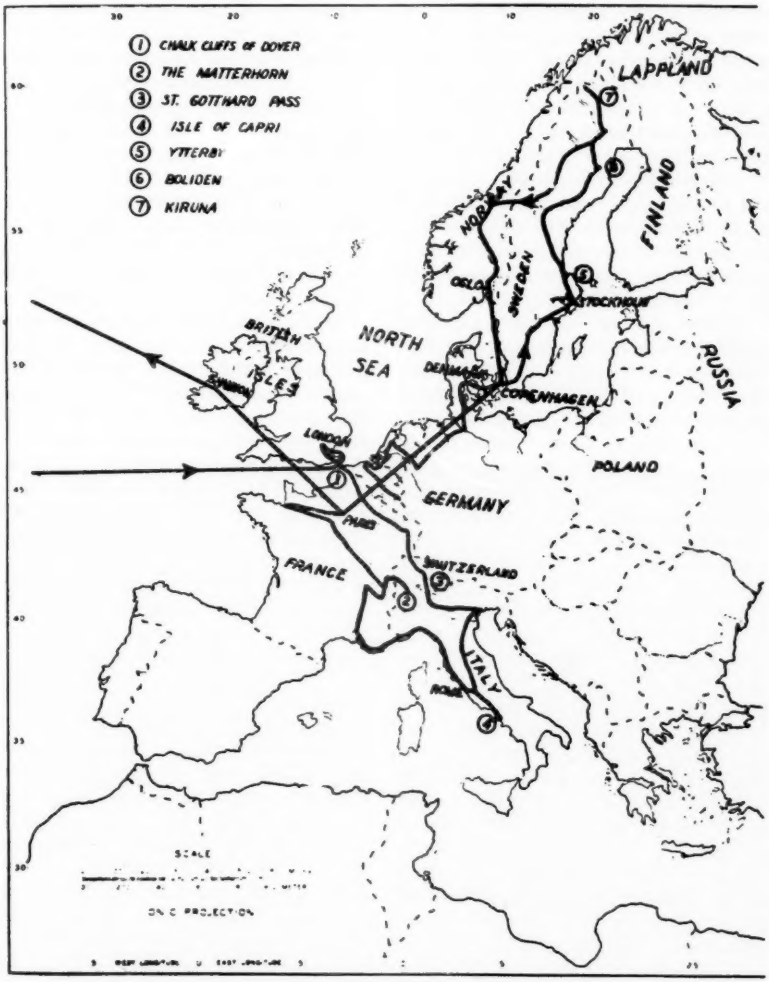
Journey Through Switzerland

Now Switzerland as everyone knows is the land of high mountains and the home of thrifty and industrious people. However from a geological and mineralogical point of view it is one of the most interesting countries in Europe and there is a vast fund of information available about the various aspects of Swiss geology. One of the pioneers in this field was Louis Agassiz who later came to the United States. His chief fame as a geologist may be attributed to his monograph on Fossil Fishes and his glacial studies. He first suggested the possibility of continental glaciation from his studies of grooves and striae identical with those found in the Alps.

Cycling from Basel to Lucerne was easy and fascinating but it was after crossing crystal clear Lake Lucerne that it became difficult and later almost impossible. The way chosen over the Alps was the St. Gothard Pass which begins near the town of Altdorf, the birthplace of William Tell. All along the route from Fluelen (near Altdorf) on Lake Lucerne up to

the summit of the pass many varieties of minerals are sold in dozens of different shops at moderately high prices. A few shops such as the one in Andermatt are devoted exclusively to the sale of minerals and this particular one has an exceedingly fine display. The proprietor told me that he had sold many specimens to the British Museum and was quite annoyed at the fact that I didn't wish to make any large purchases. Nevertheless he was very courteous and helpful even to the extent of giving me the localities of all of the minerals I purchased.

However in most of the stores it is just a sideline. The minerals are also sold at roadside stands and in general stores along with postcards, and groceries. Most of the specimens are found high in the mountains in caves and other places and are difficult to reach, so since I didn't have too much time I didn't do



Map of Europe showing some localities visited by the writer.

much collecting on my own. Quartz crystals are, as you would expect, most abundant in an infinity of shapes, forms and varieties. You can buy anything from a huge rock slab full of quite well formed crystals for about $25.00 to a small poorly shaped specimen for a few cents. There are some professional rock collectors in this area but most of the specimens are picked up by the mountain peasants when they go the high mountain slopes with their herds in the summer time.

Most of the minerals available in Switzerland can also be found in the United States, so to spend much time in the description of the minerals themselves would be fruitless. Some of the characteristic minerals of Switzerland are epidote (fine crystals), kyanite, staurolite, beryl (aquamarine), rare metallic sulfides and hematite crystals also garnet. The Alps themselves are distinctive of Switzerland and are a unique feature of this part of Europe. Previously I have had an opportunity to visit the Canadian Rockies and the two ranges present quite a contrast both from a geologic and human point of view. The Canadian Rockies are part of a general range of mountains running from Alaska to the Andean chain in South America. On the other hand the Alps form but a small portion of a great zone of crumpling which stretches from Morocco to beyond the Himalayas. The St. Gothard Pass itself is part of the central Alps, which are composed largely of sedimentary rocks; it is 6,935 feet high at the summit. This region is famous for the various types of garnet and tourmaline found in the general area.

Most of us at one time or another have heard of these little mountain villages tucked away in obscure corners of the Alps. I've always had a yen to visit one, so when I stopped at the town of Goschenen on the way to the top of the pass I took advantage of my opportunity. This particular hamlet is called Goschenen Alp and is at an elevation of 5 525 feet at the foot of the Damma Clacier. The town of Goschenen is only at an elevation of 3,640 feet so it is a rather steep climb in places. The village is reached only by mule trail and it takes about three hours of steady walking from the main highway. But the scenery is really marvellous. Here is the perfect example of the youthful valley with its pronounced V-shape and swiftly flowing river. The trail is very rocky but the ascent is gradual in most places and one only has to be careful not to trip on a loose rock and sprain an ankle.

On the way up I met the postman accompanied by his mule on his way to deliver the mail and some supplies. He walked at a slow, leisurely pace, and was not nearly as anxious as we to reach our goal. The slopes are extremely steep and are covered in most places with evergreens. But all along the way as we climbed we saw the homes of the local farmers perched precariously on the hillsides. No matter how steep the slope there always seemed to be people trying to earn a living from the land. Later I was to notice the same condition in Norway. I could see both the men and women working in the fields drying and gathering in their newly cut hay. All along the way were little shrines and even a few grave markers. Wresting a living from the land is extremely hard work and the local people are devoutly religious.

The small river which runs down the center of the valley is ice cold, since it contains melted snow derived from the glaciers in the mountains. The water is a dark grey in color because it flows so swiftly that it carries a great deal of sediment in suspension. The size of the river varies with the seasons, being biggest in spring when the snows melt. Since it was now summer it had receded somewhat, and we passed through large areas of water-worn boulders normally part of the river bed during the spring thaw. Every now and then we would pass a cataract where the river dropped suddenly, creating a series of small but impressive waterfalls.

At last we came out on a level plain and in the distance saw the little cluster of houses that constituted the village. All around us were towering peaks girdled with glaciers. Goschener Alp consists of a few small cottages, a church and a

small hotel. While sipping a glass of fresh and delicious ice cold milk at one of the houses I met a man in his middle sixties who was going to climb over the mountains alone. He had all his gear (pickax, hobnail boots, ropes, rucksack etc.) with him. Since he had lived in the region all his life, I guess he didn't consider it much of an accomplishment.

Journey Through Italy

Leaving Goschenen I pushed my bike up the rest of the pass and then coasted down into the Italian part of Switzerland. After spending several lovely idle days at Lake Lugano, I crossed over into Italy and Lake Como which is not nearly as nice as Lugano. From Como we went by bike to Milan and then from there took the train to Venice. Here I went for a swim in the warm and calm Adriatic at the Lido, one of the nicest and cleanest public beaches I've seen anywhere. Of course the Piazza St. Marco, the Doge's Palace, and a tour of some of the islands in the archipelago are tourist "musts" in this city.

By train I proceeded from Venice to Florence and from Florence to Rome. Third class train travel in Italy is very difficult, to describe the situation mildly. I guess first and second classes are somewhat better. Much rolling stock was damaged during the war, and there is a desperate shortage of coaches; as a result all trains are extremely crowded. To anyone contemplating a trip to Italy travel by the new and modern busses is strongly advised.

It is needless to describe here the many wonders of the eternal city. However the catacombs and the old Appian Way, both on the outskirts of the city, are sights I think no one with a geological leaning should miss. My next stop after Rome was Naples, located in the southern and poorer part of Italy. The people, however, in spite of their marked privation are friendly, cheerful and especially favorably inclined towards Americans. Of course I visited Pompei. Mt. Vesuvius is quiescent for the present, but in an eruption several years ago a thick layer of volcanic ash was spread on the surrounding countryside including Pompei. There is a fine museum here and good guides to take you thru the ruins. A guide is absolutely necessary because the ancient city covers a very large area only part of which has been exca-

The "Town" of Goschenen

vated and it very easy to get lost.

The following day I visited Capri which is located out in the Bay of Naples some distance from the port of Naples. It is most easily reached by steamers which leave regularly from the main harbor. The Isle of Capri is about four square miles in area and forms a prolongation of the peninsula of Sorrento. It consists of two ridges of Apennine limestone which differ in height and form huge cliffs, about 900 feet in height, rising abruptly from the sea. The limestones are similiar to the Urgonian or lower Cretaceous of Sicily. It is also interesting to note that a superficial layer of volcanic tuff occurs in several parts of the island.

As soon as the ship docked I took a small motorboat to the famous Blue Grotto (Grotta Azzurra). Outside the entrance to the cavern passengers are transferred to specially built small boats which take them inside the Grotto. It is a rather unsatisfactory experience, largely because the boatmen take you in and out so quickly. You have to duck down as you enter because there is only an opening of about three feet, three more feet of the entrance being under water. The Grotto itself is oval in shape and is about 100 feet wide, 165 feet long, 40 feet high and the water is 48 feet deep—all in all it is a fairly large cavern. A submerged opening gives the cave a beautiful blue light and the water is extremely clear. The Romans probably knew about this cave and used it, but the optical phenomenon which is its chief claim to fame probably did not exist at that time, later I'll tell you the reason why.

In the afternoon with a companion I swam from the village along the shore in the opposite direction and "discovered" some small grottoes. These cannot be entered by boat and one usually has to do a surface dive to gain entrance. Inside the water is just as blue as in the larger cavern. Various shades of green, orange, and yellow seem to dance over the walls, and looking down you can see clearly every rock on the bottom. It appears as if you could just touch them even though they may be fifteen or twenty feet beneath you.

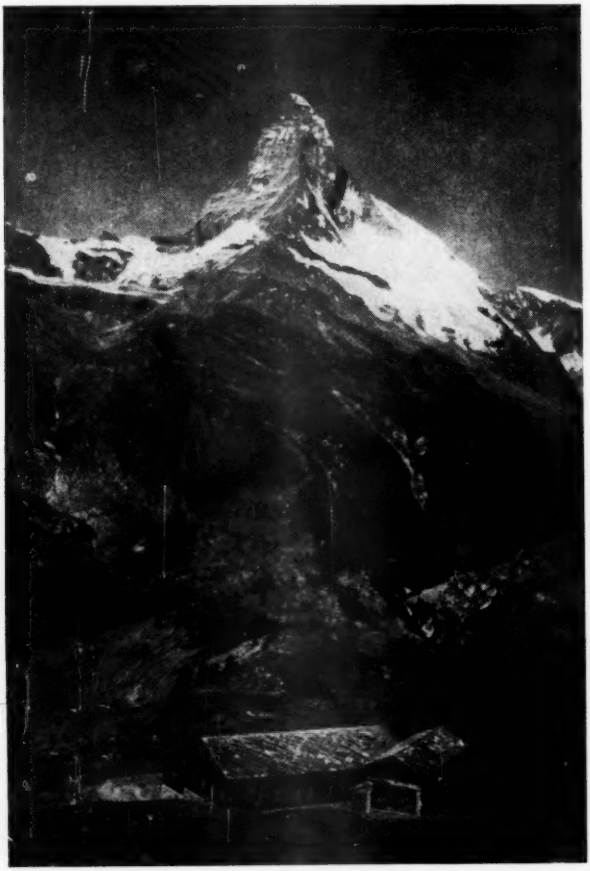
To the geologically curious these caves on Capri present several interesting questions. How were they formed? Why do the Romans make no mention of the

The harbor at the Isle of Capri

optical phenomenon in their voluminous writings? Certainly one cannot answer these questions with any definite finality but at least some fairly reasonable explanations based on observed evidence have been presented. As to how the caves were formed the most obvious answer is by sea erosion. This is partially true, but according to observations the sea only works within a limited horizon, and therefore the big caves cannot have been formed by the action of the sea alone. There are two possibilities: either the level of the Bay of Naples has changed several times or the elevation of the land has been altered. Careful observation leads us to the latter conclusion. Horizontal beds of limestone on the island have been tilted so as to dip with an inclination that increases from east to west. Also marks of marine erosion have been found 23 feet apart at the east end of the island but only twelve feet apart at the west end, a rather uneven change that can be accounted for only in terms of alteration of the level of the land. It follows from this that the optical phenomenon of the caves probably did not exist in Roman times because the land level was somewhat different than it is today.

In Switzerland Again

After leaving Naples I travelled north into France along the French Riviera and then inland by a devious route to Gre-



The Matterhorn, 14,860 ft. The ski-lift shed in the foreground

noble in the French Alps. This town is noted among other things as being the locale of Balzac's novel *The Country Doctor*. From Grenoble I biked overland thru the Alps to Geneva and from there went by train to Zermatt. All railways in Switzerland are electrified and Swiss trains run almost as well as Swiss watches. A ride from Geneva to Zermatt takes about six hours with one change, that is a transfer from the regular railway to a mountain railroad built from the main line to Zermatt. The town itself is only at a height of 5,300 feet but it is directly at the foot of the Matterhorn, one of the most famous mountains in the world, which towers into the clouds above the valley. Its scenic grandeur is due not only to glacial erosion but to the fact that this type of erosion has acted upon the tough, cliff-forming gneissic rocks which cap the relatively weak "Schistes Lustres." This last term constitutes the metamorphosed equivalent of shale. The different outcrops in Zermatt itself and in the Gorner gorges are all built up of greenstones. These greenstones contain gabbros, amphibolites, and serpentines. On the mountain itself the most important formation is the Valpelline series of a much darker color than the other formations and recognizable from a distance. This series consists of marbles with minerals characteristic of contact metamorphism, such as diorites, gabbros, peridotites, granite with muscovite, and gneiss with garnet, sillimanite, andalusite, and graphite. The present valley at Zermatt is a result of an uplift of 7,500 feet at the beginning of the Quaternary and as such is a "rejuvenated valley."

From the town of Zermatt a cog railway goes up to the Gorner Grat at an elevation of 10,280 feet. From there a beautiful view of the Matterhorn and surrounding mountains and glacier is obtained. It is really a magnificent spectacle to behold. From Zermatt I travelled thru various parts of France and finally arrived at Paris during the third week in September. About a week later I set out through Scandinavia on the second part of my journey.

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1. Bulletin of the Royal Geographic Society, 1903—Geological Study of Capri.
2. The Structure of the Alps—Collet.
3. Geology for Everyman—Albert Charles Seward.

POCKET SIZE ALPHA-COUNTER

The Nuclear Division of the Clarkstan Corporation, 11927 West Pico Blvd. Los Angeles 64, Calif., announces their Model No. 501 Alpha-Counter, a nuclear instrument for the detection of alpha particles (rays) from any source. All uranium and thorium ores may be quickly, qualitatively, and quantitatively analyzed, when the radio active content is as low as a fraction of one percent. The device is stabile in operation so that it may be calibrated against known sources and samples.

The Clarkstan Alpha-Counter utilizes a highly efficient optical system and a newly-developed phosphor screen. From these it provides a statistical count of alpha particle scintillations. Unlike the spintharascope, which must be used in the dark, the Model 501 Alpha-Counter may be used under subdued white light or red light illumination.

The Clarkstan Alpha-Counter has wide use and applications for the prospector, assayer, nuclear physicist, teacher, and mineralogist. It comes complete with luminescence-quenching filter, radio-active samples, aluminum carrying case, and complete instructions. The net price is $5.00.

The Alpha-Counter in use.

RAMBLINGS OF A ROCKHOUND

By R. F. HENLEY

4075 Nineteenth St., San Francisco 14, Calif.

Another Jaunt In A Jeep

The best time to roam the deserts of Southern California is in April, so on April 9, 1949, Clarence (Crane) and I started out in his jeep and trailer from San Francisco. We first stopped at the public camp ground in Hunter Liggett Military Reservation, then went over for a social call on Leo L. Ferris near Stone Canyon, both in Monterey County. Mr. Ferris has finally moved into the new house he has been building for the last four years, a very artistic affair, though just a cottage all by itself and situated a long way from any other habitation. His rock work is very beautiful and well thought out, the stones being laid in such a way that what little cement is used is scarcely visible.

The little stone outhouse, half above and half below ground, is a marvel for coolness. As I remember it, it has a double roof, which provides ventilation. Under the house is a bedroom or rest room where one can retire when the air above ground is too hot. The door hinges are hand-wrought. The living room is paneled above the door casings with much-weathered 1" x 6" lumber that has been rubbed down so that the hard growth rings stand out and the soft ones are depressed, then stained a soft brown for a most pleasing effect.

We next went through Parkfield, down to the oil fields through Bakersfield to Cache Creek, better known as Horse Canyon, which just now is California's most popular agate field. Here we met Mr. George MacClanahan, president of the Sacramento Mineral Society, as he was coming out, highly pleased with his success in the field. We also found Mr. R. M. Addison of San Jose, the maker of the most beautiful cameos you ever saw. They are portraits rather than cameos, and I understand he is in a class all by himself. His article on making cameos, published in the first issue of the *Lapidary Journal,* April 1947, has become a textbook on this interesting craft. He was camped with his family and he too was gloating over his success, as he claimed to have found some plume agate equal to any that ever came from the famous Priday Ranch in Oregon. Clarence and I did some digging, but not with the remarkable success of the others. This bed has been dug and re-dug and yet some fine stones are still being found. New "diggings" have now been started about half

Diggings at Cache Creek ("Horse Canyon") for agate. Some fine plume agate has been found here.

a mile north of the old one. The diggings are in the soil which has filled in the depressions of an extensive lava bed, probably as the result of wind blown dust, water washed sediment, and rotting vegetation, over many thousands of years. Clarence and I stayed several nights and from there witnessed the total eclipse of the moon.

After Horse Canyon our next stop was on the Mojave desert near Lavic, where we hunted for jasper. It is quite plentiful, though much picked over by collectors as it is within striking distance of collectors in the Los Angeles area as well as Bakersfield, which means collectors by the thousands. However, we found some good specimens, then went on to the agate beds in the Cady Mountains north of Ludlow. This area was new to me, but evidently not to others, as evidenced by the tin cans and other camp rubbish near the beds. Attractive agates are found here, but, like Horse Canyon, they require digging. Still it looks as if there is plenty for all for a long time.

Leaving this site we went straight north along the roadbed of the old abandoned Tonopah and Tide Water Railway, a relic of the days when our borax came from Death Valley. We came out on U. S. 91 a few miles west of Baker, but had to drive through about nine miles of deep sandy ruts through a dry lake bed. With a four-wheel drive jeep we made it nicely, even with a heavy trailer, but a standard car would better go back to Ludlow and around by way of U. S. 66 to first crossover to U. S. 91, which may mean about 100 miles instead of about forty. Many cars get stuck in that sand and the solution is to dig the sand out from under the rear wheels, put brush under them and deflate the tires about half. They should then pull through, but be prepared to reflate them after leaving the sand to avoid driving on soft tires.

From Baker we went north to Death Valley Junction and down into the valley, where we secured some very nice nearly white travertine. This deposit is in the side cut of the highway, hence no backpacking. I first secured some of it ten years ago, and still have a fine pair of book-ends made from it. There is another ledge of finely banded travertine close by but we failed to find it.

After spending a night in the Valley we went on through Emigrant Pass to spend the next night in Wildrose Canyon. About twenty miles from Wildrose station (motel and service station) is the resurrected ghost town of Skidoo, where, during the wild and woolly mining days in Death Valley, a "drunk" named Simpson shot the local banker because he would not dig up twenty dollars on demand. That night a lynching party took him out

Digging for travertine at Travertine Point
Death Valley, California

and hanged him. Next morning they hanged him again by daylight so that they could take pictures. At Wildrose we saw his skull and alongside it a picture of that second "necktie party."

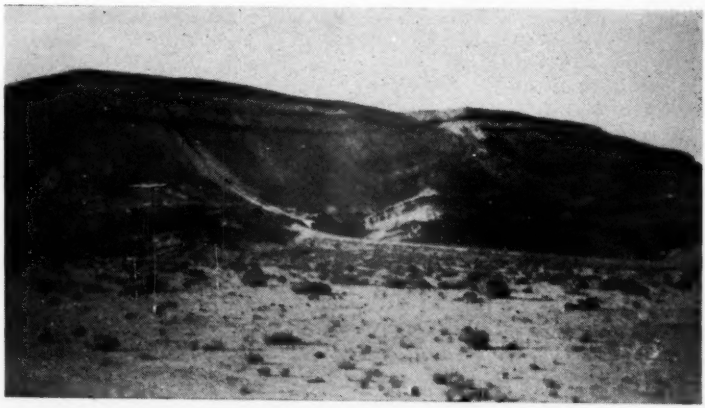
We then went down through the Panamint Valley to Trona, which is the home town of what I consider the most vigorous mineral society for its size in the State. There are some fine collecting places in this area and we spent four days collecting and swapping with the local rockhounds, some of whom were old friends as I attended their annual show in 1947. The entire town of Trona is owned by the American Potash and Chemical Company, which also maintains a recreation ground four miles north of the town and that is where we camped. The facilities include a large swimming pool, a dressing room, picnic tables, a cook house and barbecue pits, as well as a place for camping. The big chemical plant goes night and day and there are people at the recreation area at all hours.

As the weather was pretty warm, many people brought their evening meal to the camp ground for a picnic supper. The grounds, situated in the midst of the desert, are leveled and covered with a good layer of sand and provided with shade trees. One evening while we were talking with the Leonardi family (Mr. Leonardi is treasurer of California Federation), Mrs. Leonardi spied a sidewinder right in the center of our group, one hundred feet from the desert where he should have been. For the benefit of those who are not desert wise, a sidewinder is first cousin to a rattler and just as poisonous, but not so large. He travels sidewise and does not have to coil in order to strike. This specimen sidled over to the ground under the jeep, which Clarence backed up so we could finish him with a few brickbats. But you should have seen Clarence hustle over to his sleeping bag and put it up on a table. In thirty years of camping he says that is the first time he did not sleep on the ground. I told him he was one of the few persons who knows how it feels to be laid out on a slab!

Two mornings later while eating breakfast I glanced under our table and there only six inches in front of my feet was a small scorpion. We dosed him with gasoline and he is now on my table in a jar of alcohol.

In this area we secured large blocks of aragonite and travertine and our friends supplied us with some good looking crystals of hanksite, including the rare basal hanksite which comes from Searles Lake. We were also given some good samples of pyrolusite and hydrozincite, both of which fluoresce.

Our next stop was in Last Chance



Seismotite for making "Dutch Cleanser" is mined from the white horizontal vein and shot down the incline for loading into trucks. Last Chance Canyon, Calif.

Canyon, about twenty miles west of Randsburg. This is where the Cudahy Company gets the seismotite which is sold to you and me labeled "Dutch Cleanser." We secured some fine ribbon jasper which will make nice cabochons.

We then headed for our last "port of call" on the Monterey County coast, where we secured a supply of aragonite from the ocean cliffs at Willow Creek, and also picked up a few jade pebbles. After the thorough warming up on the desert I did not appreciate the cold, misty wind from the ocean and was glad to head for home, arriving in San Francisco on April 29.

It was a fine trip, but at this writing, after being home less than two weeks, my feet have started itching again. So on June 1st I shall go up to the Boys' Camp in Plumas County where, after the arrival of the boys on July 1st, I shall spend six weeks teaching those pebble-pups to polish stones.

Meantime I have made a small pair of bookends and a fine ash tray out of that white travertine from Death Valley. If you were at the big convention in Sacramento in June, 1949, you may have seen them.

Heiser Featured In Local Paper

Charlie Heiser, locksmith, gunsmith, bicycle mechanic, hobby shop operator and mineral collector of Fairmont, Minn., was nicely featured in the *Fairmont Daily Sentinel,* Wed., Nov. 2, 1949. The story took up 3 columns, topped off with a nice photo of him, and it dealt with Mr. Heiser's newest hobby—polishing rocks.

Mr. Heiser has made a number of mineral trips for gem quality minerals and one of them appears in this issue, written up by Howard E. Jackson—"Mineral Jaunt to South Dakota."

Club Doing A Fine Work!

Editor R & M:

I think it is a fine idea to publish the accounts of meetings of clubs. I read them with great interest as it is most stimulating to learn of what a large amount of interesting activity is going on. The clubs are certainly active and doing a fine work. Mineralogy seems to have gained a great deal of ground in the last few years.

Dr. H. I. Swann,
Pawling, N. Y.

November 15, 1949.

A NEW SCIENCE SERVICE FOR PROFESSIONALS AND LAYMEN

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THE OAKS CORNERS, N. Y., LIMESTONE QUARRY

By CLAUDE H. SMITH
R. D. #3., Waterloo, N. Y.

This quarry is an interesting place for a rockhound to visit, not so much for the finding of rare or beautiful specimens but more for study and exploring. It has been fertile ground for the writer, because except for the August 1948 article* nothing at least to my knowledge has been written about it, and very little known about its minerals. This article is written to bring up to date the minerals occurring at the quarry because further study has revealed new minerals not heretofore reported and also a better understanding of their occurrence.

The mineralized zone is a brownish layer of limestone that can be traced all around the quarry at or near the quarry floor. It is fairly near the surface on the north and south walls but on the west wall is deeply buried by many layers that have apparently been removed from the other walls by erosion or glacial action. This layer is different than the others in that it seems to present a curved face instead of breaking off abrupt as the other layers do after being blasted. This gives the effect of many layers of horizontal sedimentation laid down on top of a dome.

This layer is very dense and breaks with difficulty. In places it is filled with cavities from the size of a basketball on down. As a rule the larger cavities are empty except for a calcitic lining while the smaller cavities sometimes have minerals of interest. Many of the smaller cavities look like black pockets, due to the fact they are covered with small calcite crystals with what has been tentatively but not positively identified as hematite inclusions. These make the crystals and the cavity look black. The following is an up to date list of minerals noted at this quarry.

CALCITE—Lining and filling cavities, as powder and in crystals.

CELESTITE—Flat grayish crystals in cavities.

CHALCEDONY—Only one specimen found. This was in the rock above the mineralized layer and was a fossil replaced in part by grayish chalcedony.

CHERT—Plentiful in limestone above mineralized layer.

DOLOMITE — Yellowish-white crystals in cavities.

HEMATITE—This isn't certain but suspected as inclusions in calcite crystals.

PYRITE—Small bright crystals embedded in limestone. Occurs in all parts of the quarry.

QUARTZ — Small transparent and smoky crystals in cavities.

SPHALERITE—Occurs sparingly as a brown filling of cavities.

SULFUR—Occurs sparingly as yellow filling of cavities and as crystals if cavity is not completely filled.

Quite a bit of the calcite is phosphorescent under the mineralight. This is not as bright as the Texas Calcite nor does it occur in big enough pieces to make a wholely phosphorescent specimen. It is unusual in that it gives a poka-dot effect that is quite pleasing. Nice specimens are available to interested parties.

The quarry is owned by the General Crushed Stone Co., and permission should be secured before entering the quarry as it is a busy place most of the time. Caution should be used while in the quarry as the mineralized layer is near the quarry floor and can lead you into dangerous places. Watch the quarry face and if a certain section looks bad leave it strictly alone for I have seen a whole section come down carrying tons of rocks for no more reason than a small rock being dislodged from the wall.

*An interesting occurrence of Smoky Quartz, by Claude H. Smith: *Rocks and Minerals*, Aug. 1948, pp. 694-695.

WORLD NEWS ON MINERAL OCCURRENCES

Items on new finds are desired. Please send them in.

ALABAMA: A new occurrence for dufrenite is Rock Run, Cherokee County, Ala., where the mineral occurs as thick radial fibrous crusts on limonite. Color dark greenish black; luster brilliant. Reported by Dr. Frondel in the July-Aug., 1949 (p 517) *American Mineralogist,* "The Dufrenite Problem", by Clifford Frondel, pp. 513-540. (Dr. Walter F. Hunt, University of Michigan. Ann Arbor, Mich., is the Editor of the Am. Min.).

Mr. Chester Arrington of Cedartown recently brought some interesting specimens of fluorite to the Georgia Department of Mines. The fluorite occurs with coarsely-crystalline white calcite, and both are found in pockets in blue limestone. The fluorite crystals are clear green or purple color. They were obtained from an old mine, a short distance across the Georgia State line, just south of Piedmont, Calhoun County, Ala. (Georgia Mineral Society *News Letter,* July-Aug. 1949, p. 5).

ARIZONA: In the Patagonia Mts., near Patagonia, Santa Cruz County, Ariz., is found a wollastonite that is fluorescent, phosphorescent, and triboluminescent. The mineral occurs as white masses in greenish serpentine.

ARKANSAS: A new mineral has been found in Arkansas. It is a dufrenite-like mineral and has been found at Shady, Polk County, Ark., occurring as thick crusts with a parallel-fibrous structure upon limonite. The inner parts are brown, inclining toward dark brown and greenish brown in color with concentric color banding. Hardness 3½ to 4, and specific gravity 3.33. It is an iron phosphate. This new mineral is named laubmannite in honor of the German mineralogist Heinrich Laubmann, who has made numerous contributions to the knowledge of the iron phosphates. (Named and described in the July-Aug., 1949, *American Mineralogist,* "The Dufrenite Problem", by Clifford Frondel, pp. 513-540).

CALIFORNIA: Mr. Al Thrower, of Santa Cruz, Calif., sent *Rocks and Minerals* about ½ lb. of pebbles from Pebble Beach, San Mateo County, Calif. (about half-way between Pescadero and Davenport). The pebbles were most interesting, were practically all quartz, and varied in size from tiny up to 1 inch in size. Among the pebbles were basanite (black); chalcedony (white, gray, yellowish); jasper (brown, red); milky quartz, etc. Thin coatings of white cacholong opal on grayish chalcedony were also noted.

COLORADO: Specimens of chalcopyrite showing beautiful iridescent tarnish have been found at the Treasury Tunnel, ½ mile north of Red Mountain Pass in Ouray County, Colo. Associated with the chalcopyrite is sphalerite, galena, etc. This tunnel has been driven approximately four miles through the mountain to the Telluride mining area and a sizeable dump has been formed near the highway. (Note sent in by Karl Hudson of Durango, Colo.).

CONNECTICUT: In a road cut at Bigelow Pond, near Union, Tolland County, Conn., nice grayish-blue masses of cordierite (iolite) occur with oligoclase in garnet gneiss.

DELAWARE: Nice black cleavable masses of hypersthene have been found near Wilmington, New Castle County, Del.

FLORIDA: Tiny quartz pebbles (basanite, jasper, and rock crystal) occur with collophanite pebbles at the American Chemical Corp. diggings in Pierce, Polk County, Fla. (Reported by Mrs. Rena Allen of Daytona Beach, Fla.).

Florida has a new tourist attraction. It is a cave located about 3½ miles north of Marianna, in Jackson County. Discovered in March, 1937, and requiring 3 years for development, the cave now offers a convenience of travel and observation. A most interesting article by J. Roy Chapman, covering his recent trip through the cave, appears in the July-

Aug. issue of the Georgia Mineral Society *News Letter* (pp. 9-16). According to Mr. Chapman the cave is full of beautiful stalactites, stalagmites, flowstones, etc. "We might almost refer to this Florida attraction as a 'cave of countless curtains', for throughout its considerable extent, many examples of drapestone are seen, from small to large, and in varying patterns", he tells us (p. 15).

Marianna, in the northwestern part of the state, is about 15 miles south of the Alabama border. The area around the cave is now the Florida State Caverns Park.

Who's going south to Florida to visit the new cave? Stop on your way down to pick us up, we might want to go along!

GEORGIA: An occurrence of moonstone and a new hornblende locality are reported in the July-Aug., 1949, Georgia Mineral Society *News Letter*. The author of the moonstone report is J.C.C. who writes:

"On Friday, June 3rd, with Mr. Philip Hussey, his wife, June, and little "Flip", your correspondent went looking for moonstone.

"Along U.S. 23, we traveled to Duluth, Georgia. There we crossed the railroad tracks, and continued toward Cumming in Forsyth County. We crossed the Chattahochee River, and soon reached a Mr. Green's farm on our right. We turned into a field road, and drove in past the farm, crossing a small stream beyond.

"Just on the other side, we got out of the car, and began our search. Almost at once, the author picked up a specimen of good size, and Phil found another beauty nearby . After that, we collected a great many moonstones, but those first two were the best of the lot.

"In two considerable outcrops that cross the woodland road, moonstone can be found in the granite, but it is not easy to secure. Small specimens may be picked up along the road for a distance of more than a mile." (p.5)

The author of the hornblende report is Willard Grant. A portion of his report is as follows:

"Hornblende, one of the most abundant minerals in the State, is seldom found in pieces large enough to see well without the aid of a hand lens. At the old Lower Bell Creek Corundum mine, large specimens of hornblende are available on the dump in tremendous quantity. Crystal fragments seven or eight inches long are quite common. Specimens of the mineral set in white quartz make very handsome cabinet items, and are quite plentiful.

"The mine is located near Hiawassee in Towns County. To drive to the mine, take U.S. Highway 76, eight miles west of Hiawassee. Turn to the north (right) on a road marked Bell Creek Methodist Church. Follow this road about 1.8 miles, until an arm of the Chatuge Reservoir is crossed. Pass over the bridge, then take the first road west (left), pass by the Bell Creek Church, then take the fork which turns south. This is a sharp left turn. Follow this road until it runs into the lake. Stop, and there behind an inglorious chicken coop is the mine." (p. 6)

IDAHO: The finest mordenite in the country occurs at Challis, Custer County, Idaho. The mineral occurs as white "cottony" masses associated with analcite, calcite, chalcedony, etc., in a lava flow.

ILLINOIS: The most spectacular mineral from the State is the iridescent stalactitic marcasite found in the Blue Diggings (fluorite mine) at Rosiclare, Hardin County, Ill. These stalactites varied from one inch specimens up to masses weighing 100 pounds and many were of unusual beauty.

Rosiclare is a small town in southern Illinois (on the Ohio River) in the famous fluorite area of the State.

INDIANA: Nice red jasper pebbles are found in the Ohio River at New Albany, Floyd County, Ind.

IOWA: Slender, colorless selenite crystals (gypsum) occur in the gypsum deposits at Fort Dodge, Webster County, Iowa.

KANSAS: In the extreme northwestern corner of Shawnee County, Kans., interesting specimens are found of dark brown petrified wood encrusted with smoky quartz crystals.

KENTUCKY: Nice specimens of pale

brownish, transparent fluorite occur at the Frazer-Babb fluorite mine near Salem, Livingston County, Ky.

LOUISIANA: Good specimens of limonite after wood (dark brown, cellular masses) have been found in small sand hills near Marshall St., Shreveport, Caddo Parish, La. (Reported by W. M. Dickinson, of Shreveport, La.).

MAINE: The epidote-rock crystal locality on Pound of Tea Island, Casco Bay, Me. (near South Freeport, Cumberland County) has been visited by your Editor. The locality is a small barren island where epidote and rock crystal occur in thin veins in hornblende gneiss. Someday the locality may be written up in *Rocks and Minerals.*

MARYLAND: Nice Specimens of small octahedral crystals of magnetite in dark green chlorite are found at the Dinning rutile prospect, 3 miles west of Pylesville, Harford County, Md.

MASSACHUSETTS: The following item was sent in by Mr. Gunnar Bjareby, of Boston, Mass.

"In the summer of 1948, we vacationed near Rockport, Mass. Mrs. B. found an excellent specimen of fayalite in one of the many granite quarries at Lanesville. It is almost as good as the large piece in the Harvard University collection. This locality had been worked about 75 years ago."

MICHIGAN: C. O. Gettings, of Toledo, Ohio, reports visiting the largest limestone quarry in the world, at Rogers City, Presque Isle County, Mich. The quarry is 2½x15 miles in area and only 50 feet deep; it is operated by the Michigan Limestone and Chemical Co. The only minerals found in this huge quarry were a few small calcite crystals; a few fossils were also seen.

MINNESOTA: C. F. Colvin, of Northfield, Minn., reports that on a recent trip to Lakeland, Minn., (just across the St. Croix River, near Hudson, Wisc.) looking for agates in an excavation being made for a new bridge across the river, he was surprised to pick up a stone matrix with a perfect "Scottie dog" natural formation in it.

Nice reddish agates occur around St. Cloud, Stearns County, Minn., according to Ivan Sackman, of St. Cloud, who sent a number of interesting specimens to *Rocks and Minerals.*

MISSISSIPPI: Waldo E. Ford, of Wesson, Miss., sent *Rocks and Minerals* a sample of sand from Copiah Creek, Copiah County, Miss., (about 8 miles east of Hazlehurst). This location of sand covers much territory east of the Illinois Central R. R. and is noted as an excellent cement sand material. The sand is coarse grained, dark grayish in color, and consists almost entirely of quartz (chiefly colorless — but milky quartz, iron stained quartz, rock crystal, and brown jasper are also present); a small amount of magnetite is the only non-quartz noted but the black mineral can be detected only by a magnet.

MISSOURI: The following item has been submitted by T. A. Patterson, of Granby Mo.

"The discovery of two unusual occurrences at Granby, Mo., was made by members of the Independence (Mo.) Gem and Mineral Society while on a field trip to Granby, July 10, 1949.

"Forrest Ingram found several octahedral crystals of galena, which were the first lead crystals in this form ever found at Granby.

"Paul Carpenter found four clear sparkling quartz crystals on a background of calcite, such crystals are very rare at Granby and were so charming that the members of the Independence Society called them 'Granby Diamonds'."

MONTANA: The following bit of information comes from Arthur H. Roat, Finley Point, Polson, Mont., covering a placer gold operation worked by him.

"High up in the Rocky Mountains of Montana, a few miles, as the crow flies, west of the Continental Divide and north of Avon, Powell County, is the Finn mining district. This is an old placer district dating back to the late 1860's and early 1870's when it was "gold rush days" in many gulches of the district, among them Washington Gulch, where the Roat placer mining claims are located.

"The 'diggings,' as we call them, are not accessible by vehicle but are reached

by a narrow, steep pack trail. Dredges at two different times have worked the mouth of the gulch leaving piles of rock and gravel. The gulch, by its piles of tailings, rocks, dumps and tunnels shows it was well and widely worked in the old days but the old timers missed places here and there on the creek bottom and on higher ground away from water. Our claims are workable only during the spring and early summer, due to lack of sufficient water to move ground into the sluice boxes. We have washed gold from these claims since 1932.

"The gold is found as nuggets with very little fine gold and comes in all sizes from small grains to large ones of $100 value. The gold is found in gravels with rock or clay bedrock and is recovered by sluicing. The nuggets come as thick ones, thin, and flat ones, some are smooth and shiny, others are sharp edged, all come in attractive shapes and patterns.

"P.S. I hope to get around to sending you a few rocks from Lake County real soon."

NEBRASKA: A rounded mass of native copper about 1½x2 inches in size, was obtained some time ago from an old collection. The label accompanying the specimen gives the locality as Ogalla, Keith County, Nebr. If any other occurrences are known for native copper in Nebraska, we would like to hear of them.

NEVADA: Deep pink rhodonite masses in black massive quartz (manganese-stained quartz) are found at Battle Mountain, Lander County, Nev.

NEW HAMPSHIRE: Unusually nice transculent, gemmy masses of rose quartz occur at Marlboro, Cheshire County, N. H.

NEW JERSEY: Middletown, Monmouth County, N. J., is a locality noted for dufrenite. In the course of examination of dufrenites from various localities by Dr. Clifford Frondel, it was found that some from Middletown were beraunites. The Middletown beraunite has a reddish brown color in bulk with a concentric color banding in shades of dark greenish brown. The streak is brownish yellow with a tinge of olive drab. The luster is vitreous and brilliant, inclining toward resinous on cross-fractures. ("The dufrenite problem", by Clifford Frondel, July-Aug., 1949, *Am. Min.* (p. 537) pp. 513-540).

NEW MEXICO: An extensive occurrence of staurolite is found about 10 miles northwest of Pilar, Taos County, N. Mex. In order to reach the deposit it is necessary to turn off the main highway about 12 miles north of Pilar and climb to the ridges east of the highway. Crystals over an inch in length and numerous twinned specimens are found in the mica schist over a wide area. (Note sent in by Karl Hudson of Durango, Colo.).

NEW YORK: William F. Whalen, 598 E. 138th St., New York 54, N. Y., sends in the following news item:

"I hate writing so much that I would prefer to have a tooth pulled instead, however, I must write to report a number of collector's paradises right here in New York City.

"The extensive dumping of rock going on near Bowery Bay (near LaGuardia field), Astoria, Queens, has yielded a dark brown apatite crystal in pegmatite, a pale greenish beryl crystal, books of biotite and muscovite, clinochlore, columbite in pegmatite, epidote on microcline (many fine specimens including black crystals in calcite, are all over the place), garnet, limonite, malachite crusts on smoky quartz, pyrite, rock crystals up to 1 inch, some having inclusions of green chlorite, stilbite, tourmaline, also fine specimens of chlorite schist, tourmaline altering into mica, etc. This place is only a block or two from the Astoria Casino in Astoria, Queens (last stop on Steinway Street bus). The rock and minerals being dumped come from an excavation on Broadway and 61st Street in New York City.

"Many nice specimens of gypsum may be had at the National Gypsum Company's yards near the East River on about 156th Street in the Bronx, but I have not yet learned the locality from which it comes. Across the street on the dumps of the Alloy Metal Product Company may be found fine specimens of azurite and malachite, but again I have not

learned the locality from which they came.

"On Staten Island, in a serpentine outcrop near Emerson Hill, I found white calcite crystals, black botryoidal hematite, dark brown oolitic limonite, smoky quartz crystals, and brownish quartz pseudomorph after radiating goethite."

NORTH CAROLINA: An interesting mineral is xanthitane which is found at the Jones Mine, near Tuxedo, Henderson County, N. C. The mineral is found in light-yellow wedge-shaped crystals (pseudomorph after titanite). (Reported by Horace W. Slocum, of Rock Hill, S. C., who sent samples to *Rocks and Minerals*).

NORTH DAKOTA: Golden yellow, fine drusy crystals of calcite form thin seams in dark gray compart limestone at Linton, Emmons County, N. D. (Reported by Mrs. Paul A. Bens, Aberdeen, S. D.).

OHIO: In the last issue of *Rocks and Minerals* it was stated that Strontian Island, Ottawa County, Ohio (in Lake Erie) was famous for its fine celestite crystals. C. O. Gettings, 2001 Starr Ave., Toledo, Ohio, recently visited South Bass Island (the largest island in the group on which is Put-in-Bay) and the following is an account of his trip:

"Last Wednesday (July 20th) we went to Put-in-Bay to see the celestite cave. It is too wonderful to describe. The Crystal Cave is about fifteen feet in diameter and really is a vug or large geode. The inner surface is entirely covered by large well terminated celestite crystals of a light blue color. The crystals range in size from three inches wide to sixteen. The largest being sixteen by twelve by three. Mr. Heinneman who owns Crystal Cave and the winery on the same property, as well as the Mammoth Cave about a hundreds away, has several nice crystals on display in the entrance to the cave. I did everything but twist his arm to get him to sell one. None is for sale.

"After visiting the caves we went to the west end of the island where the cliffs are about thirty feet high. There is a beach nearly twenty feet wide extending for about a half-mile. We searched the limestone cliffs for pockets of celestite and found several four to six inches in diameter. The crystals were badly weathered and not suitable for specimens.

"I inquired of several of the older men at the island as well as the captain of the ferry as to the location of Strontian Island. One told me that it was now called Green Island and others told me that it must be Put-In-Bay because little celestite is found on Green Island. I noticed that the last issue of *MINERALOGY, By KRAUS AND HUNT,* mentions Put-In-Bay as the locality for good celestite crystals.

"We then went to Castalia where we gathered considerable tufa rock. This is calcerous grass and limb casts formed by the saturated water from the Blue Hole. This is an outlet of the underground river which is first found at the bottom of Seneca Caverns, some fifty miles southwest. Quarries in this locality abound in fossils of the crinoids and small brachiopods. I found several very good Leptaena rhomboidalis and Schizocrania Filosa. While not for the mineral minded, I thought it interesting that the ground surrounding one of the small abandoned quarries several miles south of Bellvue was covered with wild CACTUS. This is the only place I have ever seen them growing wild in Ohio."

Mr. T. Orchard Lisle, Editor of *The Oil Forum* (11 W. 42nd St., New York 18, N.Y.), calls our attention to the world's largest sandstone quarry located in South Amherst, Lorain County, Ohio. We would like to know more about this quarry and its minerals. Can any reader oblige?

OKLAHOMA: Ash Lovett of Mangum, Okla., has sent R&M a number of interesting specimens from his locality. One of them, from the Wichita Mts., of Greer County, not far from Mangum, consists of rough black monoclinic crystals in a 3x3 smoky quartz pebble. The specimen did not look interesting, the crystals were assumed to be hornblende of poor quality. The specimen was broken open to see what the inside might reveal — reddish stains indicated iron may be present and the broken interior of the crystals showed a crystalline structure. The reddish stains and a few simple tests

identified the crystals as hematite. The hematite is a pseudomorph and apparently after hornblende — the largest crystal was 2" long and 5/8" in diameter.

OREGON: Oregon is noted for agates, but very nice jaspers also occur. Near Baker, Baker County, is found a beautiful mottled jasper (mostly red with crystalline pyrite).

PENNSYLVANIA: Mr. L. J. Duersmith, 933 Spruce St., Columbia, Penn., has sent to *Rocks and Minerals* a number of interesting specimens from his area. The most interesting is a dark gray tetrahedrite mass with azurite and malachite on dark gray limestone which comes from the Billmeyer limestone quarry at Bainbridge, Lancaster County, Penn. The Billmeyer quarry is now the only locality in Pennsylvania where tetrahedrite may be found.

Another interesting specimen is a dark brown deweylite on dark green serpentine from the Wood's chrome mine, near Texas, Lancaster County, Penn. This specimen is from a larger one that measures 4x5, which Mr. Duersmith had donated to the Franklin and Marshall College Museum in Lancaster, Penn. The large deweylite he had found on Sun., March 6, 1949, when he visited the old abandoned mine along with Mrs. Duersmith and Dr. and Mrs. H. K. Groff. (The dumps of the old mine still produce good minerals).

On inquiring as to the origin of the name "Texas" for the famous chrome locality (the name can't be found on any map), Mr. Duersmith replies as follows:

"After inquiring at several places and asking some of our local authorities, the only answer I could glean was this — it was named by a man that had lived in Texas and moved to Lancaster County and in memory of the State of Texas, named his settlement for that State. This is not a proven statement but it is the only answer I could get. It sounds logical.

"On checking, I find in Bulletin 799, Geology of the McCall Ferry-Quarryville District, Penn., by E. Knopf and A. Jonas, 1929, U. S. Geological Survey — "About 3 miles east of the Susquehanna River, in Fulton Township near Lyles (locally known as Texas), there is an area of chromiferous serpentine."

"Does this answer your question?"

RHODE ISLAND: Nice greenish foliated masses of talc are found in the Manton Ave. quarry, Providence, Providence County, R. I.

SOUTH CAROLINA: Nice specimens of native gold in massive smoky quartz have been found in an old gold mine near Smyrna, York County, S. C.

SOUTH DAKOTA: "Hiddenite of gem quality, some suitable for faceting, has recently been found at the Helen Beryl Mine, Custer County, S.D. At the same locality perfect tantalite crystals up to two pounds in weight have been found, and morganite beryl.

"Small cassiterite and lazulite crystals have also been recently found at the White Cap Mine, near Keystone, S. D. Gem quality andalusite showing remarkable dichroism and white sillimanite intergrown with andalusite were found early this Spring by my wife, Jean, and I near Berne, Custer County, S. D." (Note sent in by W. L. Roberts, Rise Building, Rapid City, S. D.).

TENNESSEE: About 10 years ago, Mr. Wm. Johnson, Rt. 6, Knoxville, Tenn. found red and white agate in the Cumberland Mts., east of LaFollette, Campbell County, Tenn. The agate had been stored away soon after its finding and only recently did Mr. Johnson run across it. This may be the first find of agate in Tennessee.

TEXAS: Nice specimens of grayish black opalized wood are found at Huntsville, Walker County, Texas.

UTAH: Very fine colorful gem quality petrified wood occurs around Torrey, Wayne County, Utah. (Reported by Dr. A. L. Inglesby of Torrey, Utah, who sent R&M some wonderful specimens).

VERMONT: Loose, dark grayish-green apatite crystals have been found at Newfane, Windham County, Vt.

VIRGINIA: At Midvale, Rockbridge County, Va. is an interesting occurrence of dufrenite (iron phosphate). Specimens from the locality have been examined by Dr. Clifford Frondel, of Har-

vard University, whose findings appear in the recent July-Aug. 1949, *Am. Min.* ("The Dufrenite Problem" pps. 513-540).

Not all material examined turned out to be true dufrenite. Many were found to be a new species and were given the name, rockbridgeite, after the county.

The following is part of the report: "About half of the specimens labelled "dufrenite" examined in the course of the present study were found to give an X-ray powder pattern entirely distinct from that of dufrenite proper. The mineral is indistinguishable from dufrenite in its general appearance and has been confused with that species since earliest time. — The mineral is found in dark greenish black, compact fibrous masses. With limonite. — The original material came from the outcropping of a limonite deposit on South Mountain about one mile east of Midvale and ten miles east of Lexington in the Blue Ridge Mountains, Rockbridge County, Virginia. The specimens are ordinarily found labelled only Rockbridge County, Virginia. Several tons of the mineral are said to have been mined for distribution among collectors and dealers." (p. 523).

WASHINGTON: We are indebted to Mr. C. H. Robinson, Sr., of Puyallup, Wash., for the following two interesting items. The first:

"A 35-lb. agate, believed to be the largest ever found in the Puyallup area, was discovered Sun., July 24, 1949, by Foster Harlan and Wilford McAllister, members of the Puyallup Gem and Mineral Club. The watermelon-shaped agate was found in Pyramid creek, 10 miles from Greenwater, while the two men were wading the stream in search of agate and other minerals. Their total of rocks collected for the day was 90 lbs.

"The big agate will be cut and made into cabinet specimens. It will be on display in the hobby department of the Western Washington fair this fall. It was in a free condition and was readily spotted in the stream which is low at this season of the year" — Tacoma *News Tribune,* Tues., July 26, 1949.

The second is:

"Here is a news item Rockhounds will be glad to learn about. The State of Washington has just issued a 12"x18" x3/8"—113 page paper covered booklet giving all the localities known in the State — Part 1, covering nonmetallic minerals, has just been issued. Part 2, on metallics, is in preparation and expected to be issued soon."

Bull. No. 37—(Inventory of Washington minerals) Part 1 — Nonmetallic Minerals. Price $1.00. Published by Dept. of Conservation and Development, Division of Mines and Geology (Sheldon L. Glover)., Olympia, Wash.

WEST VIRGINIA: Good specimens of dark brown petrified wood occur at Davis Creek, near Charleston, Kanawha County, W. Va. (Reported by J. P. Erwin, of Charleston).

WISCONSIN: Large platy crystals of galena have been found at the Linden lead-zinc mine, at Linden, Iowa County, Wisc.

WYOMING: Black lustrous masses of allanite, occur near Albany, Albany County, Wyo.

ALASKA: A nice specimen of brucite (nemalite) from Shungnak (Jade Mt.), Upper Kobuk River, Alaska, has been donated to *Rocks and Minerals* by Frank H. Waskey, of Fortuna Ledge, Alaska. The mineral is a small "mass" of loose white fibers, 12" long.

AUSTRALIA: A nice little specimen of brownish opalized wood (heavily impregnated with blue and green precious opal) from Australia has been sent *Rocks and Minerals* by H. H. Batchelor of Hughenden, Queens., Australia. The opal comes from a desert locality 400 miles west of Hughenden, from a tributary of the Diamantina River which flows into Lake Ayre in Central Australia.

"The wood that is opalized is known as gidgee (locally it is like the mulga) and is still growing. It is one of the hardest and heaviest woods I know of. It sinks like iron in water and is untouched by termites. It becomes dry or green with intense heat and leaves a snow-white ash. A tree cut down and fired will burn slowly for days, roots and all. Gidgee is a variety of acacia like mulga.

"This wood opal is found only near the

gidgee trees beneath the sandstone in a gravelly wash. Most of the petrified wood is not opalized. The colors are as varied as black opal, blue, green, violet, flame, etc., or a mixture of all colors of the spectrum — sometimes very beautiful. The dark brown or black color in the opalized wood sent you is the same as the wood of the living trees now growing." (Note sent in by Mr. Batchelor).

Another note (dated June 6, 1949) sent in by Mr. Batchelor reads as follows: "Though we have had some rain, the last 3 years drought is not yet completely broken in the west and northwest, but at least we are sure of 3 months water. Very few prospectors are out after gems and those only on the Anakie Sapphire fields. The western opal fields are deserted. North of Hughenden, a few miners are out after gold, tin, silver, copper, and wolfram. Here, in Australia, the gem market is poor and likely to be worse."

BRAZIL: A new mineral, a hydrous iron — manganese phosphate and named frondelite, has been found in Brazil. The type locality of frondelite is the Sapucaia pegmatite, Municipio of Conselheiro Pena, Minas Gerais, Brazil, where it occurs in association with triphylite and other iron — manganese phosphates. It occurs in brown botryoidal masses with a radiating fibrous structure.

The mineral is named for Dr. Clifford Frondel, of the Dept. of Mineralogy, Harvard University.

An excellent article describing the mineral appeared in the July-Aug., 1949, *Am. Min.:* "Frondelite and the frondelite-rockbridgeite series," by Marie Louise Lindberg, U. S. Geological Survey, pp. 541 - 549.

CANADA: Large botryoidal masses of native arsenic are found at Alberni, B. C., Canada.

CHILE: One of the world's best known occurrences of lapis lazuli is in the Andes of Ovalle (near the town of Ovalle), Chile. The mineral is found in deep blue color, takes a good polish, and is widely used for ornaments, etc.

CUBA: Nice botryoidal masses of chalcedony are found at Baracoa, Oriente Province, Cuba.

EGYPT: Dr. C. H. Barlow, of Cairo, Egypt, spent last July and August in the U.S., enjoying a 2 months vacation; his home is in Trumansburg, N. Y. Your Editor was one of the five happy persons, privileged to meet him on his arrival in New York City, via TWA plane. (on July 8, 1949)

To the Editor's amazement and keen delight, Dr. Barlow gave him a large box of Egyptian Minerals and sands among them being:

Agate: An ancient agate necklace (date unknown but probably 500-800 B.C.), found at Sagguara, near Giza, Egypt. It consisted of 26 reddish agate beads varying from ¼ to ¾ inches in diameter.

Chalcedony: A beautiful yellowish cabochon from Gebel Yahmum, Egypt. It was cut and polished by Dr. Barlow, who is an expert lapidary.

Jasper: Very nice dark brown pebbles, including a large 3x3x4 specimen, from Gebel Yahmum.

Meteoric Glass: Some most interesting pale golden gemmy specimens from the West Desert of Egypt.

Onyx: Two beautiful 1½ inch spheres of cream-colored calcite onyx, one from Beni Suef, and the other from Ossuit, Egypt.

Petrified Wood: A beautiful specimen of dark brown jasperized wood from the Eastern Petrified Forest, 12 miles southeast of Cairo, Egypt.

There were many varieties of sands, all from dunes. There were light brownish sand (mostly quartz) also magnetite sand — both from the dunes near the village of Bulush, Egypt; light brown quartz sand and magnetite sand from the valley of the Kings, Luxor, Egypt, and from other localities.

The prized specimen of all was a beautiful sand picture depicting a desert scene in Egypt. The picture was made of many colored sands — gray, brown, red, yellowish, black, etc. — all skillfully arranged to represent a desert, hills, mountains, valleys, trees, clouds, etc.

In making the picture, Dr. Barlow had two 6x12 glass panes set in a 7¾x13½ x1¾ inch wooden frame — the panes about ¾ inch apart — and then, by using

a spoon, only, he dropped the various colored sands until the frame was filled to the top, — the weight of the sand holding the "picture" together. It must take lots of patience and be blessed with artistic skill to make one of these unique and most beautiful pictures — the picture is a double, one, too, and both sides are different. It weighs 4½ lbs.

Dr. Barlow had three of these pictures, which he himself had made.

ENGLAND: According to an announcement of the Mineralogical Society of Great Britain, the rare minerals neptunite and eudialyte, both previously unrecorded from the British Isles, are now known to occur. The minerals are found in quartz-bearing syenites at Barnavave, Carlingford, Ireland.

FINLAND: Very fine specimens of cyanite, bluish, fine-bladed and associated with massive smoky quartz, are found at Koli, Pielisjarvi, Finland.

FRANCE: Nice drusy reddish crystals of adamite on gray granite occur at Cap Garonne, near Hyeres, France.

GERMANY: White crystals of grossularite (garnet) have been found at the Auerbach iron mine, Amberg, Bavaria, Germany.

GREECE: Opalized wood, gray and brown, are found on Mytilene Island, Greece.

GUAM: R. J. Feist, of Guam, Guam, has sent *Rocks and Minerals* a large selection of minerals from this small Pacific Island. The minerals have not yet been fully examined but among those seen are semi-opal, cachalong opal, moss agate and petrified wood. We hope to have more data on them in the next issue of *Rocks and Minerals.*

Hawaii: Colorless dogtooth crystals of calcite in basalt, have been found in a small excavation near Hickam Field, South of Honolulu, Oahu, Hawaii.

Reported by Carl Klein, of Hudson, N. Y., who donated nice specimens to *Rocks and Minerals.*

IRELAND: Small transparent crystals of analcite is a common mineral in the basalt of the Giant's Causeway, on the northern coast of Ireland.

ITALY: Very fine and exceedingly transparent rock crystals have been found in the white marble of Carrara, Italy.

JAPAN: Very beautiful chalcopyrite crystals associated with galena, sphalerite, pyrite, quartz and calcite are found in the Ani copper mine, near Noshiro, Ugo Province, Honshu Island, Japan.

KOREA: Very fine though small crystals of moonstone in weathered grayish rock are found at Ranan, Korea. Sometimes loose crystals, poor in quality but showing a deep bluish chatoyancy, are also found.

MADAGASCAR: Large black sharp crystals of spinel are found at Ambia, Madagascar.

MEXICO: Beautifully crystallized wulfenites, brownish in color, are found in the Ahunada mine, Los Lamentos, Chih., Mexico.

NORWAY: Good crystals of pyrite, often 2" on the side, are found at the Holt quarry, Holtsogne, Norway.

PERU: Very good specimens of crystallized silver come from the Odin mine of Yauli, Peru.

PHILLIPINES: Small rubies have been found in the headwaters of the stream flowing into the ocean near Paracale, in southeastern Luzon Island, Philippines.

PUERTO RICO: Azurite in beautifully crystallized specimens, come from Barrio Pesas, Ciales, Puerto Rico.

SCOTLAND: Magnificent topaz crystals of a sky-blue color have been found in the Cairngorm district of Aberdeenshire, Scotland.

SOUTH AFRICA: Prehnite, the lovely green mineral, was first found near Capetown, South Africa, in 1779, and named for its finder, Col. Prehn. (see *Rocks*

and Minerals, Jan. 1946, p. 23). For some years, *Rocks and Minerals* has been trying to learn if the mineral can still be found in the area, but with no success.

Mr. Karl Janes, of Capetown, a new subscriber, was appealed and below is his reply:

"I have been carrying your letter of Feb. 24, 1949, with me and asking everybody I knew about prehnite which was found near Capetown over 100 years ago. Nobody knows anything about that. Not at the University, not at the Museum."

SPAIN: Small emerald crystals on white calcite have been found in Cartagena, Spain.

SWITZERLAND: A locality noted for large brown axinite crystals on a dark green crystalline rock is Galenstock, Uri Canton, Switzerland.

A letter from Dr. P. K. Staehelin, Basle, Switzerland, gives some interesting information on the locality.

"Galenstock, a mountain 3580 meters high, is situated in the Central Alps directly on the border line separating the Cantons Uri and Valais. The Galenstock lies 2 kilometers north of the Furkapass. When travelling from the Tavetsch (Grisons) over the Furkapass to Andernatt (Urserntal, Uri) one has a fine look on this pyramidal mountain which dominates a more or less north-south running crest with steep flanks on both sides. This crest separates the glacier of the Rhone on the west and Tiefen glacier (famous locality for huge smoky quartz crystals) on the east, the rock formation is a granite. The mineral localities generally are on the eastern (Uri) side of the Galenstock."

TASMANIA: Beautiful, tarnished, coarse crystalline masses of galena are found in the lead-silver mines at Zeehan, Tasmania.

TURKEY: Yellow jasper is found imbedded in limestone at Vourla, Bay of Smyrna, Turkey.

Booklet On How To Do Business With The AEC Now Available From Government Printing Office

A new booklet describing how to do business with the U. S. Atomic Energy Commission is now available from the Superintendent of Documents, U. S. Government Printing Office, the AEC announced today.

The booklet is entitled "U. S. Atomic Energy Commission Contracting and Purchasing Offices and Types of Commodities Purchased." It has been prepared to assist businesses interested in selling products used in the national atomic energy program. It is designed particularly for the guidance of small business concerns.

The booklet answers the questions: What is bought for the AEC? Who buys it? Where are the procurement offices located? It contains lists of the supplies, materials and equipment being purchased by or for the AEC and its contractors, the addresses of the purchasing offices and agents, and instructions on how a business firm may be considered to receive invitation to bid.

"In order to obtain business from the AEC or its contractors," the booklet states, "it is not necessary to employ counsellors, advisers, or any agents or agencies. Such persons or agencies cannot perform any service which any reader of this booklet cannot perform for himself."

The booklet is available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., for 10 cents.

Eighteenth List Of New Mineral Names By L. J. Spencer

Every 3 years, Dr. Spencer prepares a list of new minerals names. Lists 1-17 contained 2537 names and in the present list there are 173.

The 18th list appears in the *Mineralogical Magazine,* London, September, 1949, Vol. XXVIII, No. 206, pp. 722-742. The *Mineralogical Magazine* is a journal of the Mineralogical Society and copies of the above issue may be purchased (price 12s) from the General Secretary, Mineralogical Society, British Museum (Natural History), Cromwell Road, London, S. W. 7, England.

JASPER BEACH, MAINE, CHANGES HANDS

Word has come in from a reader in Maine that the famous Jasper Beach property at Machias Port, Maine, has changed hands. The beach has been leased by the new owners and no outsiders are to be allowed to collect jaspers anymore.

QUARTZ "DIAMONDS" IN OLIVINE BASALT

By ARTHUR W. CLARK
Box 61, Durham, N. C.

In California's Northern Coast Ranges, in Napa and Lake Counties, somewhat more than one hundred miles north of San Francisco, quartz is present in substantial quantities in a series of olivine basalt flows. It has long been recognized that quartz and olivine do not crystallize together from a parent magma. This is necessarily so, since quartz is pure silica, while minerals of the olivine, or chrysolite, group are silica-deficient, being orthosilicates of magnesium, calcium, iron, and manganese. In these minerals, which may be regarded as salts of orthosilicic acid, what little silica was available is all combined with the metals to form olivine. Had more silica been present in the parent melt, more would have entered into combination with the bases, and the product of crystallization would be less basic — more silicic — than olivine. Such is the case in the development of those minerals of the pyroxene group which may be regarded as salts of metasilicic acid; here the ratio of silica to the bases is higher. Thus the formation of the olivine is contingent upon a deficiency of silica in the magma from which the minerals are forming; the excess of silica which is required for the formation of quartz would preclude the development of olivine. It is true that one might occasionally encounter very small amounts of late crystallizing olivine in such a rock as granite, but apparently this results from localized silica deficiencies during the final stages of crystallization; even here, the two minerals have certainly not formed together. A rock may be said to be oversaturated with silica if primary quartz was developed; it is saturated with silica if just enough was present to combine with the available bases; in the undersaturated rocks, silica was not present in sufficient quantity to combine with all the bases. Granite is an oversaturated rock; syenite is saturated; olivine basalt is one of the rocks undersaturated with respect to silica, and quartz could certainly not have developed in it by crystallization with the olivine from the original melt.

The quartz-bearing olivine basalts in the Northern Coast Ranges of California were studied by the writer in the northern portion of the St. Helena quadrangle; they extend into the adjacent Morgan Valley, Lower Lake, and Calistoga Quadrangles to the north, northwest, and west, respectively. These basic volcanics are of Plio-Pleistocene age and are associated with lesser amounts of tuffaceous material whose eruption preceded that of the basalts in the area examined. Individual lava flows vary from less than twenty to more than one hundred feet in thickness, the total thickness of the formation reaching a maximum of five hundred feet. Except for the Quaternary alluvial, slide, and terrace deposits, the volcanics are the youngest rocks in the area. The lava was erupted onto the unevenly eroded surface of the land, flowing over, around, and against existing topographic features. Following the major orogeny of the area during the Pliocene, the volcanics were erupted and spread unconformably over the contorted Upper Jurassic rocks of the Franciscan-Knoxville group. Subsequently gentle warping developed in the flows, probably during the mid-Pleistocene diastrophism. They now remain as small plateaus and hill cappings, generally with steeply eroded cliffs. Some are fresh; others have been leached until they are stained and porous. A few of the flows are vesicular, and brecciation was produced locally by the chilling of upper crusts on flows which were still in motion.

Other than for the highly unusual presence of included quartz, most of the rocks are normal from the petrographic point of view. A suite of these basalts was studied under the microscope. Typically, phenocrysts averaging half a millimeter in length and reaching a maximum size of two millimeters are imbedded in a microcrystalline pilotaxitic groundmass constituting about 85% of the rock. Olivine

predominates among the phenocrysts, while labradorite, together with a somewhat lesser amount of augite and about 1% of magnetite forms the flow-banded groundmass. Alteration of the olivine to iddingsite has progressed to varying degrees. In a few specimens, plagioclase, augite, and other minerals are sparingly distributed among the phenocrysts. The composition of the olivine is similar to that of the peridot used as a gem. It may properly be called chrysolite, generally containing in excess of 70% of the magnesian forsterite molecule; in a few specimens, the fayalite content may approach 35%. The specimen showing the greatest diversity in its mineral assemblage was one containing not only olivine phenocrysts and quartz xenoliths, but also phenocrysts of augite and hypersthene, and xenocrysts of oxyhornblende and plagioclase, the latter with reverse zoning. This assemblage suggests that magmatic mixing here led to the formation of a hybrid rock.

One characteristic of these basalts stands out. It is the inclusion of the aggregates of perfectly clear, crystalline, colorless to pale amethystine or smoky quartz. In some places they abound; elsewhere, they are not to be found. Some of the lumps approach the size and shape of a hen's egg, but most are much smaller. Though they constitute only a minute proportion of the rock, it is truly remarkable to see the intimate association of quartz grains with the olivine crystals. In slides and stream beds, the quartz xenoliths have generally fallen loose from the large volcanic blocks, leaving irregular cavities. Many of the quartz lumps have been shattered, but in some areas large chunks are scattered about quite plentifully. These are the "diamonds" of "Diamond Meadows" along Putah Creek, where many specimens have been collected.

To the unaided eye, the larger masses have the appearance of irregular fragments from large clear crystals of quartz; yet all but the smallest ones are readily seen with the help of the microscope to be aggregates of anhedral grains. Some of these aggregates contain not only quartz but also very minor amounts of one or more of the following: plagioclase, calcite, augite, biotite, and magnetite. In no case could these minor constituents be seen without the microscope. Each quartz inclusion is surrounded by a reaction rim or corona in which augite is the chief component. Where the reaction progressed sufficiently, the corona surrounds nothing but one or more quartz anhedra. Presumably these quartz masses were produced by the rising of the basaltic magma through Franciscan-Knoxville arkosic sandstones from which pieces were torn loose. Subsequently, the xenoliths derived from the Jurassic rocks reacted with the basic melt, and the feldspar in the arkose was largely "digested" during the process. In this manner, the augitic reaction rims developed around the quartz nucleus, the degree of alteration varying among the specimens.

It may be seen that though the quartz and olivine are indeed intimately associated, the quartz is not primary and does not owe its origin to the basic parent magma of the basalt. Rather, it represents foreign material picked up by the melt during the course of the extrusion. Yet the combination is a most unusual one, and the evidence that testifies to the foreign nature of the quartz could be seen only with the aid of the microscope. The solution of puzzling field problems must often be relegated to the laboratory.

GLYCERINE POPULAR WITH CUTTERS IN AUSTRALIA

I have been using glycerine and diamond dust (finest quality) on phospher bronze lap for polishing sapphires and get splendid results and quicker than with lead laps—less heating and not so messy.

All opal cutters here in Australia now use glycerine for opal slitting as slitting and polishing with oil is messy; glycerine also is so easy to wash off.

H. H. Batchelor
Hughenden, Queens,
Australia.

A PERIDOTITE BODY IN THE LARAMIE MOUNTAINS, WYOMING.

By JOHN P. ALBANESE

Condensation of Thesis submitted to the Department of Geology and the Graduate School of the University of Wyoming in partial fulfillment of requirements for the Degree of Master of Arts.

A peridotite body, 2½ miles long and ½ mile wide, is located on the east flank of the Laramie Mountains, Wyoming, in sections 19, 20, 29 and 30, T 27 N., R 70 W. The longitudinal boundary line between Albany and Platte Counties runs through the approximate center of the area. Wheatland, the nearest town, lies 25 miles to the southeast. U. S. Highway 87 is 10 miles due east. A county dirt road, which extends due west from Dwyer Junction on U. S. 87, passes within 2½ miles south of the area. A dirt road (Harris Park Road) trends north from the above mentioned county road and lies ½ mile due east.

The area lies on the approximate boundary between the Great Plains and the foothills of the Laramie Mountains. It is in a mature state of dissection. Gneiss outcrops in the Preacher Creek area have a northeasterly trend. Hornblende schist usually outcrops as long, narrow subdued ridges. Cottonwood Creek bounds the area on the North. It drains eastward and has developed a mature valley which averages 4000 feet in width. Preacher Creek with an approximate gradient of 80 feet per mile, flows south and enters Cottonwood Creek. This creek is flanked by high ridges where it passes through the peridotite. Its course in peridotite has been partially controlled by a fault zone, which it follows for some distance.

The peridotite is located in an area of pre-Cambrian gneisses and hornblende schists. The peridotite body lies within the core of a closed, asymetrical, southwest plunging syncline. It contains an inner core of diallage-peridotite and a marginal zone of bronzite-peridotite, both of which are coarse grained and display lineation. Contact zones between the gneiss and peridotite are present at various places along the margins. The regional strike of gneiss and hornblende schist is to the northeast, and both are steeply dipping. Lineation and axes of drag folds in gneiss plunge to the southeast. Quartz monzonite gneiss encloses the peridotite, and its strike parallels the margins of the peridotite. The gneiss formed by metasomatic replacement of pre-existing hornblende schist. The structure of the schist largely controlled the extent of replacement.

The peridotite is completely surrounded by gneiss. On the basis of lithology and textural differences, the peridotite can be divided in two main zones. The core and the bulk of the peridotite body consists of diallage-peridotite; while the outer rim, which completely encloses the core, is composed of bronzite-peridotite.

Diallage-peridotite weathers to a light brown color on the outcrop. Unweathered diallage-peridotite is typically a dark greenish gray, coarse grained (5 mm.) massive rock composed primarily of diallage and olivine (chrysolite) with very minor amounts of phlogopite. Diallage constitutes from 40 to 55 percent of the rock. It invariably displays a fine lammelar structure and quite commonly shows twinning, often polysynthetic. Olivine occurs as anhedral grains, rarely twinned, intergrown with diallage and comprises from 35 to 50 per cent of the peridotite. In thin sections, olivine appears to form a matrix enclosing diallage.

Bronzite-peridotite is a dark green, coarse grained, usually massive rock. It tends to be coarser grained (5 to 10 mm.) than diallage-peridotite. The same structural features that are present in non-sheared diallage-peridotite exist in the bronzite-peridotite. The main difference between the two rock types is the presence of bronzite in the bronzite-peridotite which consists mainly of diallage, olivine and bronzite with minor amounts of phlogopite. Bronzite tends to occur as elongate,

anhedral grains which average 10 mm. in length. Island replacement structure of diallage in bronzite is also present. Sutured boundaries between adjacent diallage grains and other recrystallization features are quite common.

Along the margins of the peridotite body there exists in places a zone of altered peridotite between the gneiss and normal peridotite. This zone of altered rock constitutes the entire northwestern margin of the peridotite, the southern tip of the body and is also present at irregular intervals along the eastern margin of the body. The biotitic quartz monzonite gneiss, adjacent to the altered peridotite zones, is the typical gneiss of the area. It contains abundant epidote (pistacite and clinozoisite). In one locality, along the eastern margin, the contact gneiss contains long blades of green, pleichroic chlorite which has replaced biotite.

Quartz monzonite gneiss is the predominant rock type in the Preacher Creek area. It encloses both peridotite and hornblende schist. The contact between gneiss and peridotite is conformable and sharp. The essential minerals in the quartz monzonite gneiss are plagioclase, microcline, quartz and biotite. Accessory minerals are muscovite, epidote (pistacite), zoisite, thulite, clinozoisite, garnet, magnetite, chlorite and sericite. From 15 to 50 per cent of the gneiss consists of plagioclase; the anorthite content of which varies from 33 to 45 per cent. Microcline comprises from 17 to 35 per cent of the gneiss, displays a gridiron structure and is variable in grain size. The gneiss is composed of from 25 to 50 per sent quartz. Biotite is widespread and common. It is present in all gneiss in the Preacher Creek area. Thin lenticular inclusions, composed entirely of biotite, are locally present in gneiss. These inclusions are quite variable in size (from small clots up to 10 feet in length), are oriented parallel to gneissic foliation and probably represent remnants of altered hornblende schist. These biotite inclusions are also present in the core of some drag folds in gneiss.

Hornblende schist, as steeply dipping, narrow lenticular bodies, is profusely scattered throughout the gneiss. The hornblende schist bodies range from 1 to 50 feet wide, and from 3 feet to 1¼ miles long. They are generally aligned in a northeast trend. A massive rock with a diabasic structure, is associated with the hornblende schist within the same lenticular bodies. Foliated and diabasic rocks are distributed erratically and occur adjacent to each other. Schist predominates over the massive rock. Several cases were noted in the northwestern portion of the Preacher Creek area, in which hornblende schist contained abundant porphyroblasts of feldspar (.5 to 10 mm. in diameter). A gradation between porphyroblastic schist and pebbly textured gneiss exists in one locality.

The hornblende schist is composed of hornblende, plagioclase and quartz with minor amounts of magnetite, chlorite, pistacite, zoisite, muscovite, biotite and sericite. Hornblende constitutes 50% of the rock, and generally occurs as stubby to elongate crystals, which vary from .5 to 2 mm. in length. Chlorite is present in varying amounts and has replaced hornblende.

Veins of several different mineral compositions are widespread throughout fractured and faulted zones in the diallage-peridotite. Three distinct vein types are present. They consist of:

1. Calcite and chlorite.
2. Calcite and Chalcedony.
3. Albite, adularia and uralite.

The first vein type consists of massive, coarse grained calcite (35 per cent) intermixed with medium grained chlorite. The second vein type is crustified. The third type occurs within massive diallage-peridotite adjacent to fractures. Zoning is common in these veins. A case was noted in which an inclusion of diallage-peridotite was enclosed within an albite-adularia-uralite vein. Thin dark green veinlets of serpentine were observed along fractures in bronzite-peridotite.

Quartz veins are common in the gneiss. They follow joints in gneiss and usually strike at an acute angle to gneissic foliation. The quartz veins are not persistent over long distances. Some veins are only ten feet long. Only one small aplite dike was observed within the entire Preacher

Creek area. Pegmatites are absent. Quartz veins or granitic dikes are entirely absent within the peridotite. Drag folds are present within the gneiss. These folds are closed, similar, and generally asymetrical. The vertical distance between trough and crest varies from several inches to 5 feet.

The regional orientation of gneissic foliation, drag folds and lineation within the peridotite indicates that the peridotite lies within the core of a closed, asymetrical, southwest plunging syncline. Diallage-peridotite and bronzite-peridotite, in the form of concentric shells conformable within the marginal gneiss, form the cores of the syncline. The fold axis, as deduced from lineation, plunges approximately 45 degrees S. W. and its horizontal projection strikes northeast. The attitude of the synclinal axis is parallel to the regional orientation of drag fold axes, gneissic lineation, and tectonic strike. This strongly suggests that the peridotite (or an original gabbroic sill) was folded during the same period of regional deformation which created the structural elements present in gneiss and hornblende schist.

Listed in chronological order, the probable events which took place in the Preacher Creek area during pre-Cambrian time are:

1. Deposition of sediment in a geosyncline.
2. Intrusion of peridotite as a mesh of crystals or else intrusion of a gabbroic sill.
3. Folding and recrystallization of sediments and gabbroic sill (or peridotite intrusion) during regional metamorphism. This resulted in the transformation of the original sediments (probably pelitic) to hornblende schist and the conversion of the gabbroic sill to peridotite or the modification and recrystallization of the peridotite if it were originally emplaced as an intrusion in the solid state.
4. Granitization, during which time the hornblende schist was replaced by salic elements with the resultant formation of quartz monzonite gneiss. The altered zones along the margins of the peridotite were also created at this time. During the closing stages of granitization, the peridotite was subjected to two periods of structural deformation (shearing and faulting). Chlorite, tremolite and serpentine were introduced along the fractures.

The parallel orientation of the structural elements (e.g. fold axes) in peridotite, gneiss and hornblende schist strongly suggest that all structural elements (except faults and shear fractures in peridotite) were created during the same period of structural deformation. The orientation of the fold axis of the syncline within which the peridotite lies, as deduced from lineation, is parallel to regional orientation of drag folds axes and gneissic lineation. Therefore recrystallization (which produced lineation) and folding of the peridotite must have been simultaneous with the formation and folding of the hornblende schist, the structural features of which were later inherited by the quartz monzonite gneiss. That the peridotite was in existence prior to granitization is witnessed by the presence of altered marginal zones and of chlorite, tremolite and serpentine within fractured and non-fractured peridotite.

Conclusion: The original country rocks were geosynclinal sediments. These rocks were later subjected to folding and recrystallization during regional metamorphism. The sediments became hornblende schist. If the peridotite was originally emplaced as an intrusion of a mesh of crystals, it was recrystallized and folded. If an original gabbroic sill was present, it inverted to peridotite due to the migration of salic ions (in the solid state) out of the gabbro with a resulting concentration of feebly mobile Fe, Mg and Ca ions. This migration of ions resulted in recrystallization, which was necessitated by the change in chemical composition and free energy state. Later, granitic material entered the area. This material was mainly in the form of highly mobile ions of potash, soda, aluminum and silica. Solutions were present but were not plentiful. Replacement of hornblende schist by granitic material resulted in the formation of quartz monzonite gneiss, and the removal of Ca, Fe and Mg. The pres-

(*Continued on Page* 71)

FORMATION OF LIMONITE TUBES

By S. BUTLER Queens College, Flushing, N. Y.

Recent articles in *Rock and Minerals* have discussed limonite tubes with emphasis on the possibility of a fulguritic origin. On collecting trips to the Coastal Plain deposits of New Jersey and Staten Island (N. Y.) limonite tubes in a wide variety of shapes and sizes were seen almost everywhere in excavations for clay. Most of the tubes consisted of sand cemented by limonite. Limonite is abundant in this formation, cementing sand and gravel and as an alteration product of iron sulfide concretions. It is not questioned that these tubes are of aqueous origin, and that the conditions are conducive to the solution, transportation and deposition of iron compounds.

A criterion was observed which would serve to identify a sand-limonite tube which was water-deposited. The ends of several tubes were roughly polished by holding them against a fine grindstone. It could then be seen that the tubes were not uniform in cross section, but consisted of concentric rings which took different degrees of polish. The smooth rings were those areas in which the limonite had completely filled the pore space between the sand grains: the rough rings represent areas where less limonite was deposited to cement the sand. Sometimes this distinction can be made by observing the color alone.

The question arises of how and why this structure is formed and perhaps also whether the structure is a probable or constant characteristic. Actually such a structure is to be expected. Chemists will recognize this ring structure as an example of the Liesegang ring phenomenon. Liesegang rings? Every mineral collector is familiar with them, although he may not know them by name. Several types of banded structure or coloration in rocks and minerals are due to this effect.

The explanation for Liesegang rings is rather involved and there is no space for it here. But the fact is that when two dilute solutions react within a confined space, such as in a gel, a joint plane or within the pore space of rocks or sand, then the precipitate will be deposited in bands or stripes which parallel the line along which the solutions meet. Of course you've seen it! You've broken apart dozens of weathered rocks and found the joint planes covered with parallel black or rusty lines. That is the commonest example.

In the case of the limonite tubes we simply have a solution of iron, such as from oxidized sulfides, running through a channel in loose sand. Naturally some of the iron solution will diffuse radially away from the channel into the surrounding sand where it can be precipitated by oxygen in the ground water, or other means. That produces a zone of soft limonite gel and surrounding the channel. The iron solution will continue to diffuse slowly through this gel and the Liesegang ring structure will have a chance to build up. In both theory and practice the limonite gel will be deposited in dense rings separated by rings which contain less limonite.

The interiors of the tube is kept clear of limonite, probably by the constant supply of the necessarily acid iron solution. Many of the tubes contain clear sand when unearthed, but some are emply. In the latter case, the sand has been swept out by the flow of water. It must be remembered that up to this point the limonite has been kept saturated with water and is still a soft gel. If the sand interior is removed then the walls of the tube are unsupported and the roof may sag in. This is the origin of the tubes with the "longitudinal crease." In fact in large tubes the crease may become so pronounced that the cross section is heart-shaped.

After the tube has formed, the supply of iron solution may be diverted or cease. At this point the tube ceases to grow in diameter and may dry out and reach the hard condition in which it is later found.

The preceding details might serve to identify limonite tubes which originated in porous material. In clay, which is such a greatly less permeable medium than sand, this type of structure might not become sufficiently developed to be easily recognized.

THE MICRO-MOUNTER

Conducted by LEO N. YEDLIN, 557 W. Penn St., Long Beach, N. Y.

We've just acquired a new 'scope'. It's a low power stereo-binocular job, made by Leitz, with wide field, interchangeable oculars, and many other features. The National Scientific Instrument Co., of New York has just mounted it on a tilting base for easy operation over long periods of time. It's really a honey, one we've coveted, and now, perhaps we'll be better able to tell you of hitherto unseen things in the realm of the minutae. Meanwhile, our trusty old Spencer 'scope is a duplicate, and tho it was our first love in the line of stereo-binocular jobs, it must go. Many hours of faithful service it gave, both in the field and at home (it's a portable) but it must give way to the march of time.

Among our recently acquired swapping companions is Paul E. Desautels of Philadelphia (and now of State Teachers College, Towson, Md.) He has proven a find of the first water. He has supplied a suite of the minerals of Phoenixville, Pa., including mimetite, wulfenite (4 forms), 14 different types of pyromorphite, calcite, cerussite and sulfur. And best of all, some old time mounted specimens bearing the names and labels of Rakestraw, Fiss, Bement, Jefferis, Boyle, Wills, Brinton and a host of others, unidentified, but mounted in pill boxes of years gone. The specimens are all fairly good, altho once again it is interesting to note their construction. Orange shellac seems to have been the cementing agent in the past. Strong stuff, too, for in several instances the paper box disintegrated completely when we tried to remove the mount for cleaning.

We discussed with Mr. Desautels the kind of stuff sent around for exchanges. It was our view that perhaps lack of background in crystallography was one of the contributing factors to a collector's sending junk. Paul thought otherwise, and here is his opinion:

"I certainly can't believe that good micro material isn't available. The darned stuff grows everywhere. It must be that a great part of our brotherhood doesn't recognize a good specimen on the hoof. You suggest that lack of background in crystallography may be responsible but I think it goes deeper and is actually a lack of appreciation of what a good specimen is. Any novice can tell whether a crystal group is shattered and dirty even though he doesn't recognize it as orthorhombic. George English once tried to set down rules whereby a good specimen could be properly judged but it seems that the best preparation for recognizing good stuff is to look at thousands of them and pick the best looking. Above all, however, a certain esthetic sense or appreciation of beauty both mathematical and otherwise seems to be a necessity. With this equipment, after awhile that automatic classification machinery gets functioning so that a second rater is discarded without the use of conscious processes. Maybe we should found the Society for the Prevention of the Preservation of Worthless Micromounts. Your column is certainly a step in the right direction."

Knowing of our penchant for mineral inclusions, Mr. Desautels sent us some, and then caused a drooling at the mouth by saying: "One of my good specimens consists of a half inch piece of quartz from Africa which is perfectly transparent, has been ground flat on one face and highly polished. Inside the quartz are about two dozen single complete sharp and beautifully spaced dioptase crystals! Sounds good, doesn't it." We should say so.

Many collectors have labels printed up to cover exactly the top of the m/m box. Initials, names and addresses or other data are printed thereon, and make for a better mount, for, like a signed painting, the artist is loath to let his work go out of his possession if it is sloppily done.

Another point in labelling. Most collectors adorn the top of the mount with the necessary data. The late William H. Broadwell always maintained that someday someone would mix up the tops and get the works jumbled. Well, we think that any one should be able to identify the minerals in his collection, but what if you're looking at say cubes of pyrite in quartz from seven localities, and someone, not a true collector, knocks the bunch off the table while serving coffee? Then you've got something to make you swear off java forever. To avoid such horrible result, label the bottom of your mounts as well. Or at least put a corresponding number on the top and bottom. Just a thought. We'd hate to see anyone give up coffee.

Let's see. We've acquired the following inclusions: cassiterite in quartz, Schlackenwald, Bohemia; gold in quartz (polished), California; sphalerite in fluorite, Cumberland, England; chalcocite in calcite, Cornwall, England; tourmaline hairs in quartz, Butte, Montana.

What we like about conducting this column is receiving mail. Some months ago we told of observing m/ms under U. V. light, and casually mentioned the light sources. From Texas came a letter requesting information, not of the minerals, nor yet of the techniques involved, nor of the microscope, nor of any phase of the art. It was the ultra violet light we used that was the basis of the inquiry. Well, it just goes to show that subscribers to *Rocks and Minerals* read the magazine from cover to cover (as we do) and so we'll try to oblige.

For such things as calcium-larsenite, scheelite and others we use a 15 inch germicidal tube in an ordinary fluorescent desk lamp, with a long filter. This latter is supplied by Corning Glass Co., of Corning, N. Y., and is called "Red-purple corex A, 986." The tube costs about $6.00. The desk lamp, anything you want to pay for it in your local department store. The filter runs about a dollar a square inch.

To give best results with such minerals as fluorite, hackmanite, Texas calcite, ruby, sphalerite, manganapatite, zircon, wernerite, etc., we use a Gates "Raymaster," manufactured by the G. W. Gates Co., Franklin Square, L. I., N. Y. This is a high pressure lamp, takes a couple of minutes to warm up, but is excellent. Price $42.00, but obtainable only from your dealer, or from Ford or Hamonneau in New York City.

Another card, this one postmarked Atlanta, Ga., and signed "A very rank amateur" really gets fundamental. It says: "I am new in the mineral hobby and keep seeing micro mounts referred to and have been unable to find out exactly what size specimens these are, and if you need a microscope for them. Perhaps in your column you could go into this elementary angle for us newcomers in this game. Maybe there are others who are like myself . . . ."

Maybe we're wrong at that. The column has always been written with the idea that it was for those who had been mineral collectors for some period of time and knew what it was about. There must be hundreds, however, who would like to work with the 'scope who do not have such experience. Once again we suggest getting a copy of *Rocks and Minerals* for December 1931. "The Preparation of Micro Mounts" by L. C. Wills, M. D., is the featured article, and it covers every phase of m/m collecting and preparation far more adequately than the micromounter can in the limited confines of this column. Mr. Zodac, editor of R & M, assures us that a good supply of this issue is available. Two other articles on the subject, both by Jay T. Fox, of Seaford, L. I., N. Y., are "musts" for the beginner (as well as advanced collector) of m/ms. These are "Micro Mineral Mounts, Preparation and Mounting Technique" (November 1942) and "Micro Mineral Mounts, Their Illumination and Visualization" (December 1940). With these nothing further is needed but time, ambition, a love for the hobby, and an ample supply of boxes. Until recently the boxes were the most difficult of all to obtain.

MINERAL JAUNT TO SOUTH DAKOTA

By HOWARD E. JACKSON
Moose Lake, Minn.

Bright and early Sunday morning, August 21, 1949, my good friend and pal, Charlie Heiser, of Fairmont, Minn., and his son, Frank, drove up to the house and wanted to know how long it would take me to get started for South Dakota. Well it was about 1:30 p.m. before we got everything lined up and packed in and on the car and at 2:00 p.m. we left my home on the first lap of the journey which was to take us to the Hanna iron mine at Crosby, Minn., where we arrived about 3:30 or 4:00 p.m. and where I soon got busy looking for binghamite and thus forgot to note the exact time of our arrival. We hunted about an hour (I found a nice 2½ inch square piece of binghamite) when Charlie remarked that if we wanted to make Benson that night we would have to get going as we still wanted to stop at Royalton to get some Staurolite crosses.

Royalton, Minn.

It was 5:00 p.m. when we arrived at Royalton, in central Minnesota, and we soon began picking up staurolite crystals. We got a lot of the straight or single crystals and a few double crystals or crosses. Before long, however, it began to get dark and we had to give up hunting staurolites and seek out a camping spot for the night where we pitched our tent.

Benson, Minn.

We reached, Benson, Minn., about 7:30 a.m. the next day and on reaching the town went in search of some rockhound friends, the Peterson boys as we call them. I do not know their given names; one owns the Ford Garage and Service Station and the other is Postmaster of Benson, a little town in western Minnesota. I wish every collector could see the collection the Petersons have. One of the boys had a new collection of "picture wood" (petrified wood) of which he could be justly proud. He also had some very fine thomsonites and Isle Royale chlorastrolites. Another delightful surprise was a card of the finest iris agates I ever saw, bar none. But all good things must have an end and we had to leave.

Milbank, S. D.

It was about noon when we reached Milbank, S. D., (in the northeastern part of the state). There are large granite quarries at Milbank but we were already feeling the pinch of time and so could not stop.

Pierre, S. D.

We pushed on to Pierre, the Capital of the State, (in the central part of South Dakota). where we camped for the night by the side of the Big Muddy River. In the morning we started to climb out of the valley and on reaching the top we stopped to see if we could find some agate or any cutting material of any kind. We found some nice petrified wood and a few moss agates of which some were filled with small dendrites like the famous Sweetwater moss agates but the body of the stone was milky and not clear. We also found a few South Dakota prairie agates.

Fossils Near Wall, S. D.

We continued our journey westward to Wall, in western South Dakota, near which town are some fossil beds. A friend of mine had told me to be sure to stop on the west bank of the Cheyenne River, some few miles west of Wall, to collect some of the fossils. On reaching the locality we stopped at a filling station and asked permission to look for fossils. We were told to go ahead and look for them. The attendant told us that he had collected a lot the past spring but the best had been sold. So up the hill we went where we found a nice lot of *Orthoceras* or chambered shell in straight line some with the pical still clinging to them. We collected other fossils such as *Brachiopods* that looked like our hog toe clams, a few small *Nautilus* in which the shell body was more round, and some *Ammonites* whose shell was flat.

Rockhounds Visited

It was getting late in the evening and so we thought it best to go on. We

continued westward toward Piedmont, S. D., where we hunted up the Black Hills Rock Garden and that fine proprietor, William A. Sloan, one man who is in the game because he loves it. We found him on Hiway 14 and 79 and visited with him all evening, trading some of our Minnesota minerals for some from his part of the country.

In the morning we backtracked to Rapid City and then went south to Hermosa, S. D., to see Zacadil's Agate and Gift Shop. Zacadil is another fine fellow. Here was one place where I was ashamed of some dealers in my home State who had sent him some so-called thomsonite which were no more thomsonite than are the nails on my fingers. Well he now has some real thomsonite, as my good friend Charlie Heiser has seen to it. It was through Zacadil that we learned of our next find and that was old Tom Fiet at Scenic. So off we go to Scenic, S.D., by way of Rapid City and route 40 to find Tom just as busy as ever, in fact too busy to go out with us for those wonderful Black Agates. Old Tom is 74 years young and is out on those hills with someone every day while the weather is nice.

Home Again

We left Scenic the following day, Thursday at 3:00 p.m., and headed for home where we arrived the next day at 1:30 p.m., after taking turns at the wheel and driving all night. What a fine bunch of collectors we met and what a huge bunch of rocks we now have to cut and polish!

FUKUI EARTHQUAKE

Entirely new aerial photographic techniques for analysing earthquakes and earthquake damage are described in a geological report recently issued by Far East Command Headquarters, concerning the Fukui earthquake of June, 1948, in the Japanese island of Honshu. Immediately following the quake, low-flying reconnaisance planes blanketed the affected region with aerial photographs which aided geologists and rescue workers who entered the area the following day.

The aerial photographs were used to determine the amount of damage to man-made structures, as well as to evaluate geological changes in the area. Although aerial photos have been used extensively by geologists in recent years to locate oil fields and to study terrain, this is the first recorded instance of their use in connection with modern earthquake studies.

Determined by geological observors to be the third most violent Japanese earthquake within historic times, the Fukui quake was the second major seismic disaster in the four years since U. S. troops occupied Japan. The violent earth shocks affected only about 200 square miles in western Honshu, but within this small area 75% of the houses were destroyed, roads and railroads were badly damaged, and levees along rivers were shattered. Approximately 5,000 people were killed by collapse of buildings and from fires started by overturned stoves and charcoal braziers. As in the case of the San Francisco quake of 1906, most destructive in U. S. history, structures built on soft ground or mud flats suffered the most damage.

Investigation of the earthquake area was undertaken at the request of the military authorities to secure information which might prevent future loss of life and property. The resulting geological report was prepared by geologists from the U. S. Geological Survey with the aide of personnel of the Far East Command and Japanese seismologists.

Japanese scientists have organized a thorough investigation of the earthquake area with the approval of occupation authorities. The report of this work is expected to throw light on practical means of constructing safer houses in earthquake areas of Japan.

Like Ecuador, which recently suffered one of the most costly earthquakes in human history, Japan lies in the earthquake belt which girdles the Pacific Ocean. Although only one in several hundred is highly destructive, about 400 earthquakes per year occur in the Japanese islands. For this reason, Japan has for many years been one of the world's major centers of earthquake research.

MOLYBDENUM IS VITAL NEED IN MOST SOILS

By THOMAS R. HENRY

A vital need in plant growth of which an ounce per acre fills all requirements, but which is deficient in most soils and fertilizers, is the rare element molybdenum.

It is a metal, now used as an alloy for hardening steel, the 15th element now demonstrated to be essential for agriculture. In any plant tissue, it constitutes less than one part per million.

Dire effects of molybdenum deficiency in soil were reported to the American Chemical Society in Atlantic City by three chemists of the New Jersey Agricultural Station. The element is especially essential, they reported, for the leguminous plants—peas, beans, and the like—which have the particularly important function of fixing the indispensable element, nitrogen, in the soil. In some way not yet understood, the rare metal comes into being in this process. If there is not enough of it, the legumes develop a disease called chlorosis. They whiten and die.

Molybdenum fertilization also adds greatly to the nutrition value of other crops, notably alfalfa as a stock feed, Dr. H. J. Evans and his associate reported. It increases the amount of proteins, essential bricks of tissue, in the hay, and later in the meat of the animals who eat it.

The element is widely distributed in nature, and soils over a large part of the country may have enough of it. Analysis has shown minute amounts of molybdenum in potashes and limes used as fertilizers, but usually it is considerably below the minimum requirement in cases where the soil is deficient.

This general distribution is probably why need of the element has not hitherto been recognized.

The Arizona Republic, Phoenix, Ariz., Thurs. October 20, 1949.

LARGE NUGGETS IN THE U. S. NATIONAL MUSEUM

A letter was sent by the Editor of Rocks and Minerals to Mr. James H. Benn, U. S. National Museum, Washington, D. C., requesting information on a large tin nugget. Mr. Benn replied as follows

"The 'tin nugget' you mentioned in your letter of August 20 is a boulder of cassiterite on exhibit in the hall of economic geology here in the National Museum. It weighs 184 pounds and is probably the largest mass ever found in North America. Our records show that it came from the Discovery Claim, Goodwin Gulch, Cape Mountain, West Seward Peninsula, Alaska.

"Among other nuggets on display, which may be of interest to you and your readers of *Rocks and Minerals*, are the following:

"A gold nugget found near Greenville, Plumas County, California, at the Union Placer Mine. This property was owned by two old miners, Joe Baccla and Billy Roedde, who had long worked the mine unsuccessfully and finally hit "pay dirt" by finding the largest nugget from that area in many years. It weighs 81.9 Troy ounces and shows a small portion of the original vein quartz from which it was derived.

"A silver nugget from near Globe, Pinal County, Arizona. The specimen is approximately 10 x 5½ x 4 inches in size and weighs 448 ounces.

"Two unusually large nuggets of platinum, one from Nijni, Tagilsk, Russia, weighing 15.85 ounces and the other from Choco, Colombia, South America, which weighs 17.27 ounces.

"An iridosmium nugget of several ounces from Australia. Iridosmium is a natural alloy of iridium and osmium.

"And the 'grandfather' of all nuggets, the three ton boulder of copper from the Ontonagon River, Michigan, which was deposited by the glacier back in Pleistocene times."

COLLECTORS' COLUMN

Conducted by A. CAL LECTOR

This column, which began with the Sept.-Oct., 1948 issue, is of special interest to beginners in mineralogy, as we comment briefly on one or more of the common minerals. In the Sept.-Oct., 1949 issue, we talked on beryl. This feature did not appear in the last issue, for lack of room. This time we will take up biotite, a very common mica.

BIOTITE

Biotite is a very common mica. It is generally black in color but green, brown and other colors are also known. Mica (a word derived from the Latin, Mico, to shine, because the mineral often sparkles brightly in the sunlight) is the name given to a number of minerals which can be split easily into extremely thin sheets. Biotite is one variety of mica and it was named after the French physicist, Jean Baptiste Biot (1774-1862).

Localities for good crystals of biotite are not too numerous although the mineral is very common and found everywhere. Perhaps the best known foreign locality is Vesuvius, near Naples, Italy, where the mineral has been found for many years.

In the United States, a locality for unusually good sharp lustrous crystals is a small abandoned mica mine (Beechy Bottom mica mine) in Bear Mt. Park, Rockland County, New York. Some of the crystals are over 3 inches long and an inch thick.

Biotite is commonly found as small black flakes or sheets in granite, gneiss, schist, etc. and often associated with muscovite (white mica). Because of its prevailing black color, biotite is often called "black mica."

Biotite contains iron and when it decomposes it takes on a golden-yellow color so that it is frequently mistaken for gold. This golden-yellow decomposed biotite is called "cat-gold."

Order a few specimens of biotite from your favorite dealer for your mineral collection. The dealer can supply specimens from many localities, domestic and foreign. Start your mica collection right with biotite!

BICKFORD BUYS NOYES COLLECTION

Robert F. Bickford, of Norway, Maine, recently purchased the entire George L. Noyes Collection which is especially noted for apatite, quartz, and tourmaline. The specimens in the Collection come chiefly from Noyes Mt., in Maine, which locality has been worked by Harvard University for purple apatite. In the collection are many beautiful smoky quartz crystals in singles and in groups, purple apatite in matrix, etc.

Mr. Bickford is one of Maine's noted mineral dealers and his store, known as Maine Minerals, located at 159 Main St., in Norway, is a popular stopping place with visiting collecting.

ADDENDA TO GILLETTE QUARRY ARTICLE

In the Sept.-Oct., 1949, issue of *Rocks and Minerals*, appeared an interesting article, "The Gillette Quarry, Haddam Neck, Connecticut," by Helen Stobbe. Unfortunately the references to Figure 2 got lost before printing and so they did not appear. The following are the references for Figure 2, p. 499:

Addenda

Figure 2. A generalized geologic map of Haddam Neck and vicinity with locations of some other pegmatites, modified from Foye, 1922, p. 5, and Cameron and Shainin, 1947, p. 355.

Pegmatites: 1. Hollister, 2. Andrews, 3. Case, 4. Bordonaro, 5. Gotta-Walden, 6. Strickland-Cramer, 7. Hale-Walker, 8. Western, 9. Consolidated No. 1, 10. Consolidated No. 2, 11. Slocum, 12. Selden, 13. Gillette Quarry.

CLUB AND SOCIETY NOTES

ATTENTION SECRETARIES—If you want your reports to appear in the March-April issue, they must reach us by February 20th—the Editor.

LAS VEGAS GEM SHOW

The Clark County Gem Collectors' first show was held over Armistice weekend in Las Vegas, Nevada, and its large attendance was a source of much gratification to its members and an indication that it was a very successful one. Registration was not compulsory, but on the basis of actual registration the committee estimate that the attendance for the three days was between 4200 and 4500 persons.

The show was formally opened by Governor Vail Pittman and Mayor Cragin of Las Vegas, and added to the interesting list of featured displays was the well known group of Star Sapphires owned by the Kazanjian Brothers of Los Angeles which, besides their four large rough sapphires and the "Black Star of Queensland," also for this show included the "Star of Anakie"; a blue-green Star Sapphire of 139.8 carats of flawless quality, and their double black Star Sapphire of 290 carats.

One of the members of the club, Harold Julian, put on a very interesting demonstration of facet cutting, which feature was a center of attraction for many of the visitors. A large Black Opal in the collection of one of the members also attracted much favorable comment. The Cedar City, Utah, Rock Club and the Bureau of Mines of the Interior Department exhibits drew much attention. First prizes were awarded to Paul Mercer for Mineral Specimens; Charles Hamilton for Cabochons; and Henry Lindsey for Silver Work. Grand Award for the best display went to Paul and Ann Drury.

Las Vegas Club Elects New Officers

At the final business meeting of the year the Clark County Gem Collectors elected the following officers for the coming year: Bill Brown, Las Vegas, President; Cortez Cooper, Boulder City, Vice-President; Annette J. Drury, Box 1028, Las Vegas, Secy-Treasurer. Two Directors were elected: Paul Mercer of Boulder City, in recognition of his faithful performance of duties to the Society for several years, and Paul O. Drury.

The Club members instructed a committee to attend to incorporation of the Club.

During December field trips were taken to Keyhole Canyon for Indian artifacts and to the Searchlight area for petrified mountain mahogany. After a year full of activities the Club celebrated the Christmas holidays with the usual party held at the museum of the Club's member, Mrs. Anna Parks.

Paul O. Drury, Publicity Director
P. O. Box 1028, Las Vegas, Nevada

AMERICAN GEOLOGICAL INSTITUTE PLANS AIDS TO COLLECTORS

The second Annual Meeting of the Board of Directors of the American Geological Institute was held in El Paso, Texas, on November 13, 1949. Officers elected by the Board for the coming year are:

President: William B. Heroy, Beers and Heroy, Dallas, Texas. Vice-President: Earl Ingerson, U. S. Geological Survey, Washington. D. C. Secretary-Treasurer: Ernst Cloos, The John Hopkins University, Baltimore, Md.

The Board adopted a basic policy that since the Institute had been formed for the "advancement of geology and its application to human welfare by providing a means for the cooperation of organizations active in the fields of pure and applied geology," all organizations whose aims fitted within this broad objective should be encouraged to affiliate with the Institute.

Of particular interest to the readers of *Rocks and Minerals* was the decision to implement a long-range program of earth science education at the junior and senior high school levels through cooperation with local geological societies, regional, state and local educational organizations, and state geological surveys. The board also approved three projects which will be useful to the collector and amateur geologist. One of these deals with the issuance of a bibliography of non-technical books, pamphlets and articles on various aspects of geology. A second will result in the publication, early in 1950, of a complete catalogue with index maps of the geological guide books and road logs which have been prepared for many parts of the United States. The third project will be of principal interest to collectors and will involve the preparation of a list of material (minerals, rocks and fossils) available for exchange between departments of geology or between individuals. Further information may be secured by writing to David M. Delo, Executive Director, American Geological Institute, 2101 Constitution Avenue, Washington, D. C.

North Country Mineralogical Club
(Plattsburgh, N. Y.)

Our last field trip for the 1949 season was held on Sunday, October 2nd, to Isle la Motte, in Lake Champlain. Though in Vermont, the island may be reached by a series of bridges from the New York shore. We visited first an old marble quarry, from which especially beautiful black marble has been obtained. Picnic lunch was eaten at this spot. Later in the afternoon a second quarry was visited, and a gravel bed. We stopped briefly as well at two historical sites on the island, one where a group project for hand weaving was carried on, the other the shrine of St. Anne, location of the first white settlement in the State of Vermont.

The regular October meeting of the club was held at the Plattsburgh Public Library on October 13th, with Arthur M. Sandiford of the Champlain College faculty in charge of the program. He used a microscope and projector to show the reaction of various minerals treated by chemicals. Magnified pictures of the crystal structures formed were shown on the screen. Among the more unusual shapes which occurred were the silver and lead "trees", illustrating the displacement series in metals. Other metals shown in their crystal forms were iron, cobalt, zinc, and copper.

The October study meeting (a series begun last year, and to be continued during the winter months this season) was held on Thursday evening, October 20th. William R. Ellsbury, the club president, spoke on the origin, occurrence, and association of minerals. He discussed the three types of rocks; sedimentary, igneous, and metamorphic, explaining the conditions under which each type is formed. For each kind, he mentioned some regions of the world in which especially fine examples are found. His listing of minerals commonly found together will be of help to members on future field trips.

At the November meeting of the club, Mr. Ellsbury showed Kodachrome slides taken last summer on the field trip to Valcour Island, Chapel Pond, and Isle la Motte, and on a week-end "rock-hunting" trip to Maine which three of the club members took last September. The remainder of the program was devoted to a discussion of the minerals collected this summer. Several members displayed particularly good specimens found. Samples of graphic granite, talc, and rock containing sections of tourmaline crystals were given to those wishing them for collections.

The November supplementary study meeting was held in one of the science laboratories at the Plattsburgh State Teachers College. Dr. Everett A. Manwell began his talk by telling some of the old ideas about what fossils were and why they occurred. He explained that now they are regarded as one of the best evidences of evolution, indicating the development of simpler, then gradually more complex, forms of life. He discussed the various ways in which they may be formed, the places where they occur, the age of different types, and the practical values of fossil study. On display accompanying his talk was a large fossil collection recently acquired by the State Teachers College science department. This collection includes many forms of both plant and animal life which have become fossilized.

The regular December meeting of the Club was held on Thursday evening, December 8th, and included the annual Christmas party. Miss Emma Walter, librarian of the Plattsburgh Public Library, had fixed for us an attractively decorated and lighted Christmas tree. Small gifts were exchanged and refreshments served. The program for the evening featured fluorescent minerals. Mr. Sandiford explained the principles of fluorescence, then displayed a wide variety of beautiful specimens. These included calcite from Texas, wollastonite from California, and several kinds from Franklin, New Jersey. While fluorescent minerals native to this section of New York State are rare Mr. Sandiford showed calcite crystals from Chazy and from Ellenburg, N. Y., and a rock containing talc and tremolite from Fowler, N. Y., which exhibited this property. Some of the specimens displayed showed phosphorescence, as well as fluorescence, including a few with the somewhat rare red, blue, or yellow phosphorescence.

The annual election of officers will take place at the January meeting.

Gertrude E. Cone, Sec.
Keeseville, N. Y.

The Los Angeles Lapidary Society
P. O. Box 2184, Terminal Annex
Los Angeles 54, Calif.

The Los Angeles Lapidary Society had a practical demonstration on Cabochon Cutting and Polishing given by Bert Monlux at the November meeting held in the Griffith Park Auditorium.

Seeing is worth many times more than all the books in the world. To see the actual rough piece of agate ground, sanded, and polished to a nearly optically perfect surface by a master craftsman, gave the members more information than can be measured. This is the most informative kind of Lapidary program that can be given, judging from the large number of people that have expressed their desire for more of the same.

Mr. Monlux received much of his technical experience from Mr. Odell of Montana. It was the combined efforts of these two Super Gem Cutters that created a technique of highest perfection.

Good Lapidary programs are the main interest of every meeting. It is the desire of President Vic Gunderson and program Chairman Norman Cupp to supply this type of entertainment to the many members.

Ted Schroeder, Cor. Sec.

Pacific Mineral Society
October Meeting

Pacific Mineral Society Members and guests enjoyed "An Illustrated Talk" by Dr. Ivan Campbell, who gave comments on the International Geological Congress in Britain in 1948. Dr. Campbell is Associate Chairman of Division of Geological Sciences at the California Institute of Technology. He is active with the American Institute of Mining and Metallurgical Engineers, and is an outstanding authority on minerals in this district.

The International Geological Congress was first held in 1878 with the French Government as hosts in Paris, at that time there were about 25 present. The last meeting was attended by 2,000 scientists from all over the world, who helped to strengthen international friendship. The 17th meeting was held in Russia in 1937. A meeting is usually held every three or four years and the officers elected hold office until the next meeting. During the war years the 18th meeting was scheduled for Great Britain in 1940, so the Russian officers were in office until 1948. The next meeting will take place in Algeria in 1952.

November Meeting

Pacific Mineral Society members and friends enjoyed a series of slides with comments on "Granite Bursts" by Dr. Richard Jahns, who is with the Department of Geological Sciences at California Institute of Technology. He was with the U. S. Geological Survey. It is always a pleasure to hear Dr. Jahns, as his talks are expressed so that visitors not familiar with geological and mineralogical terms may enjoy his lectures.

The most extensive granite of commercial value in the United States is located in Vermont and 65 per cent of the granite used comes from Vermont and Massachusetts. Granite is formed in layers very similar to the layers of an onion, and can be cut off in "steps" by cutting thru one layer at a time. Looking across the quarry it appears to be in huge steps. A derrick 125 feet high can drill a hole 52 inches in diameter using steel shot as abrasive. This 52 inch core may be used as a column for buildings or slices 18 inches deep are used for curb stones.

The Fletcher quarry covers 43 acres. A quarry is started by making an opening and then slabbing off areas which form steps along the walls and keep working away from the opening. The cutting itself is done by a circular saw consisting of a long thin steel cable that has been twisted.

Often where a cut has been made leaving a nice smooth surface, the pressure is so great that a large chunk will be blown off falling into the quarry. One piece was thrown with such force that it cut a heavy duty compressor in half.

A foreman was standing on the surface of a quarry when all of a sudden he found himself in the air. The layer of granite he was standing on suddenly heaved upward with force enough to toss him about four feet in the air. This was a layer of granite about a foot thick that formed a space above the next layer similar to the appearance of the sidewalk when a tree root forces the section up into an angle.

These stones that crack are called working stones, they snap as though talking to give a warning then go sailing thru the air. The fractures occur more frequently in the deep part of the quarry than they do near the surface. When a cut has been made it seems that nature tries to fill up the place by expanding.

Mr. Joe Bradley had on display a Geiger Counter to test any specimens brought in. There were several specimens from the new discovery location near Baker showing Bastnasite. This location has been kept quite secret until the Bureau of Mines released a statement from Washington.

December Meeting and Christmas Party

At the regular December meeting the annual Christmas party and turkey dinner was enjoyed by members and friends. The tables were decorated with candle Christmas trees and an attractive gift box tied with bright ribbon and colorful tree ornament marked each guest's place. These boxes contained specimens from the collection of Mrs. Kaler who has been collecting from all over the world for almost fifty years. After dinner, Mr. O. C. Smith led the group in singing Christmas carols with Miss Underwood at the piano.

Mr. Roy Martin then gave a review of the color pictures taken at the Convention in Sacramento last summer showing the colorful costumes worn by the members, several views of the mineral cases including Jim Underwood's prize selenite crystal from Death Valley, and the historic places visited.

Auctioneer Jack Craig then auctioned off many beautiful specimens collected from across the United States, from Mexico, England and Burma. Leon Heghinian bought the prize of the evening when he bid on a "pig in poke" and received a biscuit.

The field trip for December was planned for a three day trip to Death Valley. It was just ten years ago this New Years that the Pacific Mineral Society spent the holiday in Death Valley. After a long up-hill hike, which ended in a steep climb that halted most of us, those that had pep to go on to the "diggins" found crystals to make up for the steep climb. Jim Underwood came away with the prize of all—a large selenite crystal. At the time it was the largest crystal ever to be found in Death Valley.

Myrtle Musselman
Box 463,
Lomita, Calif.

Pomona Valley Mineral Club, Inc.
Pomona, Calif.

The fourth annual banquet of the Pomona Valley Mineral Club was held on November 8 at the Claremont Inn with Arlo Rickett as toastmaster. Jerry Laudermilk of Pomona College spoke to the club on Unusual Geological Formations of Pomona Valley. He displayed specimens of graphite, some of them local, and described the way by which physicists determine whether the carbon in this mineral has originated from animal, vegetable, or inorganic matter, through the ratio of the two carbon isotopes present. Dolomite from Thompson Creek was shown. This contains thirty or more minerals whenever it has come into contact with molten magma.

Mr. Laudermilk is an authority on the subject of desert varnish, a coating on rock usually formed through the action of manganese and iron hydroxide and varying in color from tan to black. It is found in areas other than the desert wherever an iron solution has penetrated the rock. This iron coating, as it works its way in, tends to swell and to break the rock. In Cascade Canyon, rocks are found with a coating of iron tannate which is similar to ordinary writing ink. This results when iron carbonate, coming from carbonic acid in the soil and iron in the rock combines with tannin from vegetation, particularly from oak leaves. Another varnish-type stain contains iron hydroxide and nitrogen.

As an interesting sidelight, he explained that silicates such as opal and chalcedony are not found in areas of the country with much vegetation, even though there is silica in solution present, for plants use silica in the growth of their stems. These silicates are formed in the desert where there is no vegetation to use this silica.

Mr. Laudermilk concluded his lecture with a discussion of magnetic volcanic bombs. The magnetite present in certain of the volcanic bombs from the Pisgah Crater area show polarity but the basalt in the flow in nonmagnetized. The bombs showing polarity, although of the same chemical composition as the flow material, are homogeneous and dense. Mr. Laudermilk explains their polarity on the following grounds: the bombs were plastic when they left the crater; iron oxide or magnetite is one of the first component minerals to crystallize and cools while the rest remains plastic; as a result the magnetic field of the earth can pull and orient these particles of magnetite while the rest of the bomb remains plastic. The location of the poles on the bomb depend on how each one lay in relation to the earth's magnetic bands.

Open house this month was held on November 14 at the home of Mrs. Gladys Gilmartin in Ontario.

At the December meeting of the Pomona Valley Mineral Club, Mrs. A. F. Dossee showed beautiful colored motion pictures, covering many well known and little known sections of the western United States which she has taken on many and lengthy summer vacation trips. Scenes from many national parks, including Yosemite, the Grand Tetons, the Grand Canyon, General Grant, and Mesa Verde were shown, as well as places of interest seen going to and from these parks. Of particular interest to the club were pictures of many mineral localities in the desert area which were taken of field trips made with several organizations.

Nancy L. Taylor
Publicity Chairman
845 Indian Hill Blvd.
Claremont, Calif.

Wasatch Gem Society

The Wasatch Gem Society held its annual display and election of officers on December 2nd, 1949. The new officers are:

President, Ed Dowse; Vice-President (reelect), Mrs. Geraldine Hamilton; Secretary (reelect), Helmut Wachs; Treasurer (reelect), Mose Whitaker.

At the annual display, the members did the judging and voted 1st Award ribbons on:

Facets — Ed Dowse; Cabochons — Helmut Wachs; Slabs, polished—Kenneth Stewart; Ornaments — Geraldine Hamilton; Jewelry—Kenneth Stewart.

Of the five winning displays, the facets cut by Ed Dowse was chosen the best and he was given the Grand Award Ribbon.

There was a good number of displays and a large number of visitors came to see them.

Kenneth Stewart,
67 S. State Street,
Salt Lake City 1, Utah

San Fernando Valley Mineral and Gem Society

San Fernando Valley Mineral and Gem Society, Inc., held an election of Officers, to take Office January 1, 1950. They are as follows:

President, Mr. Glen Craig; Vice-President, Mrs. Elinor Waller; Secretary, Miss Grace Johnson, 1155 Irving Ave., Glendale 1, Calif.; Treasurer, Mr. Sumner Smith, Jr. Mr. E. G. Lilleberg was elected for 3 year term, Building Trustee.

Mrs. W. C. L. Cooper, 445 W. California Street, Glendale 3, California, has taken the Editorship of the Club's Magazine "Rocks and Gems."

Recent field trips have been to Mule and Horse Canyons. There will be no field trip for December. Arrangements are now in progress for the Annual Christmas Party, Thursday, December 8, 1949, at 7:30 P. M. at Sepulveda Women's Club, 15236 Parthenia, Sepulveda, Calif. There will be an exchange of Rock Gifts.

Agatha W. Lynn,
Publicity Director

Tucson Gem and Mineral Society

Annual election of officers of the Tucson Gem and Mineral Society was held at the December 6th meeting. Retiring officers were: President, Mr. S. L. Wolfson; Vice-President, Mrs. A. H. Murchison; Secretary-Treasurer, Mrs. Jean Serrano. Some very nice mineral specimens were presented by the Club to each one, in appreciation of their services for the past year. New officers elected for the coming year were President, Mrs. A. H. Murchison; Vice-President, Mr. George W. Baylor; Secretary-Treasurer, Mrs. Lena Marvin.

Meetings are held the first and third Tuesdays of each month in room 106 of the Arizona State Museum Building on the University of Arizona Campus. Visitors are cordially invited to attend.

Many excellent speakers have addressed the Society during the last year, notably among these: Dr. Frederick H. Pough, Curator of Mineralogy and Physical Geology of the American Museum of Natural History. At the November 15 meeting, Dr. Pough gave a most informative and interesting illustrated talk on famous gems in the J. P. Morgan collection. Mr. S. F. Turner of the Arizona Ground Water Survey, First President of the society, will speak on Arizona Gems and their locations at the December 20th meeting.

Field trips for the Winter season are being organized; one to the Helvetia Mining District is scheduled for December 18th.

A display of gems and mineral specimens from collections of the Society members will be shown from February 21st to March 12th, 1950 inclusive in the State Museum of Arizona on the University Campus.

David P. Record,
4400 So. Mission Road,
Tucson, Arizona

Queens Mineral Society
85-01 118th Street
Richmond Hill 18, N. Y.

On the occasion of our December 1st meeting, we had the pleasure of viewing a film, "The Story of Zinc". The various phases from diamond core prospecting, shafts, cages and mining methods employed at Balmat, N. Y., the rough crushing and smelting of the ore, types of apparatus used were shown. The resulting products, lead, zinc, cadmium and sulphuric acid and their applications were also shown in the film which was produced for the St. Joseph's Lead Co., and presented to our members by Mr. E. Abernathy.

Mr. Fredericks related some of his experiences in the Balmat and neighboring localities. We were told that the collecting at Edwards was poor due to the dense nature of rock and lack of cavities or XLS. The mine is operated for lead and zinc which are obtained on approx. a 50-50 basis. The nature of occurrence of zinc at Ellenville, N. Y., and Lisbon, N. H., as well as the famous Franklin, N. J., locality were discussed. We were informed that the Wurtsboro mine area is being diamond core explored and that this activity has revealed a good ore body approx. 30 feet thick.

Mr. Abernathy and Mr. Fredericks were accorded a rising vote of thanks.

William Stadler, Sec.

Mineral & Gem Society of Castro Valley

The Mineral and Gem Society of Castro Valley held their regular monthly meeting Friday evening (November 18, 1949) at the Community Center Building. Mr. E. R. Lamberson of the East Bay Mineral Society gave an interesting talk on stone polishing and told of some of his early experiences in rock hunting. Mr. Fred Dyche, Chairman of the Community Center, expressed the appreciation of that organization for the stainless steel tableware which the Society donated to them for use in the Clubhouse.

Preliminary plans were made for next month's Christmas pot-luck dinner party which will be held at the Center on Friday evening, December 9. Mrs. Janice Breeden and Don Willis won the two rock specimens which were given as door prizes. New members who were admitted at this meeting included Robin Wilcox, Jon Wilcox, Mrs. Grace Wilcox, Ted Saling, Earl Jessen, Louis Comenzind, and Waldo Lutschan.

December Meeting

The Society's annual Christmas Party was held Friday evening (December 9) at the Hayward Union High School Cafeteria where a pot-luck supper was served to about 60 persons. Mrs. Tom Robb, Chairman of the arrangements, was assisted by Mrs. B. E. Sledge and Mrs. May Myers in the serving of the dinner and in the installation of some exceptionally beautiful Christmas decorations.

After a few remarks by Chairman C. B. Branson and other officers, Christmas carols were sung and colored photographs were shown by Mr. W. E. Lewis. His pictures represented some of the beautiful outdoor scenery which he has recorded on some of his vacation trips and rock-hunting expeditions. Mrs. A. B. Emmes won the prize drawing in the form of a Ming Tree table ornament which was donated by Mrs. B. E. Sledge, Librarian, for the benefit of the Society's library fund. Mrs. G. P. Beach won the door prize of a San Benito black garnet specimen.

Gifts in the form of mineral specimens were exchanged by all of the members and visitors present. It was voted to change the Society's regular meeting place from the Community Center to the Hayward Union High School Cafeteria for the balance of the season.

Arthur B. Emmes, Publicity Chairman.
7845 Castro Valley Blvd.
Castro Valley, Calif.

NEW EARTH SCIENCE CLUB FOR NORTHEASTERN ILLINOIS

Friday evening, November 25, thirty enthusiastic people met at the home of Dr. I. G. Spiesman of Downers Grove, Illinois, to organize an earth science club for the benefit of those living in the populous suburban area between Chicago and Aurora, north of Joliet. Mr. William H. Allaway acted as temporary chairman. Several committees were formed, and the balance of the evening was spent in listening to a lecture by Stevens T. Norvell on, "Geological Features of the West." It was illustrated with eighty kodachrome slides.

No name was selected for the club. This will be done at the next meeting when those present will be requested to write their suggestions for a club name on a black board. The club name will then be selected by ballot, and the author of the winning name will be awarded a slab of blond opalized wood from Logan, Montana.

An invitation to attend a meeting is extended to everyone interested in minerals, fossils, geologic formations, ancient man, gems or silver smithing. For full information as to where the meeting will be held and how to get there, call Stevens T. Norvell on phone, Western Spring 2831 (Chicago phone, Lawndale, 1-5000, extension 2881) or Mr. William H. Allaway on phone, Downers Grove 129-J.

Stevens T. Norvell,
4449 Howard Avenue,
Western Springs, Ill.

N. O. T. S. Rockhounds

P. O. Box N 81
China Lake, Calif.

One hundred and fifty rockhounds enjoyed a field trip into the Lead Pipe-Blue Chalcedony Springs area of the Mojave Desert, Calif., November 11-13, 1949. Members of the Paso Robles, San Luis Obispo, Santa Barbara, Ventura and South Bay Clubs and the Earth Science Club of the Los Angeles City College were guests of the NOTS Rockhounds who led the trip into the rich deposites of nodules, geodes, agate, chalcedony and precious opal.

The groups camped at Blue Chalcedony Springs and worked out of the camp to the various deposits nearby. The hunting was good and everyone got plenty of nodules and geodes as well as some of the finest and largest pieces of opal to come out of the area. Agate with brown moss inclusions was plentiful but required hard work to get out of the seam. Plenty of "free" blue chalcedony was found.

Ed Snearly, President of the NOTS club, who supervised the trip, was master of ceremonies at a large campfire the first night. Besides community singing to Daniel Boone's harmonica, there was a short talk on the formation of geodes and the geology of the region. During the discussion of the 1950 Convention of the California Federation of Mineralogical Societies, it was announced that the trip was to be repeated as one of the features of the state meeting to be held at Trona, Calif., next June.

The springs and deposits are on the range of the U. S. Naval Ordnance Test Station, and though normally closed, permission was readily granted for the organized trip.

California Federation of Mineralogical Societies
1950 Convention Committee

P.O. Box N 81
China Lake, Calif.

1950 California Federation Convention Set Up One Week.

The 1950 Convention of the California Federation of Mineralogical Societies, to be held in Trona, California, has been set up one week to June 17 and 18, 1950.

According to Ralph Merrill, Chairman of the Steering Committee for the State Convention, the new dates will allow more time between the California meeting and the American Federation Convention to be held in Milwaukee, Wis., June 28-30, 1950.

Many who will attend the big outdoor rockhounds meeting at Trona are planning to drive on to the national convention and the new dates will give them ample time to make the trip.

Newark Mineralogical Society

The 266th regular meeting of the Newark Mineralogical Society was held Sunday, October 2nd, 1949 at the Newark Museum. The program was a symposium on summer collecting. The members gave very interesting reports, relating their experiences and exhibiting their choice specimens.

The 267 regular meeting of the Newark Mineralogical Society was held Sunday, November 6th at the Newark Museum. The program consisted of a talk by Mr. Albert White of Flanders, N. J., the topic of which was "Forty Years Too Late" delightfully depicting a two week mineral hunting jaunt to Maine with Mr. Wesley Hayes. Although they returned with a car laden with many fine specimens, some of which were displayed, they could not help thinking, they were about forty years too late.

Under the election of officers, the following were elected: Mr. Albert White, president, to succeed Mr. Paul G. Kellinghausen; Mr. Morris Weeks, Vice-President; Mr. Louis Reamer, Secretary; Mrs. Isabel S. Bemis, Treasurer.

Mr. Kellinghausen congratulated Mr. White as his successor and promised him his support and also the Society's.

Herman E. Grote,
95 Lenox Street,
Newark, N. J.

Santa Cruz Mineral and Gem Society

Santa Cruz Mineral and Gem Society was entertained by one of its members, George L. Theobald, at the October meeting. He discussed "The Gems belonging to the Quartz Family" displaying a fine collection of gems and cabachons he has made, together with many other choice mineral specimens. His topic was timely for new Club members who are interested in learning the art and enjoying the thrills of creating gems from the large number of stones found in the silica family.

W. O. Eddy, mineralogist and a former president of the Monterey Bay Mineral Society, delighted an appreciative audience at the November meeting. He chose for his subject, "Some Sidelights on Mineralogy", featuring the minerals of Santa Cruz County and illustrating with sample specimens. While Santa Cruz County is not one of the heavily mineralized areas of the state, there are some interesting deposits; chiefly gypsum and calcite, one of the largest industries being the Santa Cruz Portland Cement Company at Davenport. Deposits of various other minerals such as mountain leather, talc, olivine, zircon, ilmenite, magnetite, arsenopyrite, graphite and petrified woods are also found in Santa Cruz County.

Mr. and Mrs. Carl Becker, local members and former members of the East Bay Society, brought some very fine specimens for display. Several guests were in attendance, including V. L. Fraser, president of Monterey Bay Mineral Society, who spoke briefly on some of the adjacent collecting localities that would make interesting field trips. A field trip was planned for Sunday, November 13 to Pescadero

The Club now has forty-nine paid-up memberships and will continue to meet the second Wednesday of each month in the Congregational Community Hall in Soquel. Fellow-rockhounds are always welcome.

Christmas Dinner Held

Santa Cruz Mineral and Gem Society enjoyed a Christmas dinner on December 14, with 51 members and guests participating. A very successful raffle followed the dinner. Sound movies of much geological interest, procured from the University at Berkeley by program chairwoman, Mrs. R. E. Campbell, provided the entertainment for the evening.

A field trip to Big Sur and San Simeon, Calif., was planned for Sunday, December 18, in quest of jade and rhodonite. Five new members were welcomed into the Club.

There will be an authoritative speaker on "Gem Cutting" for the January 11th meeting. Friends and visiting rockhounds are always welcome.

Edythe M. Thompson,
Publicity Chairman,
P. O. Box 124,
Soquel, Calif.

San Jose Lapidary Society Announces 5th Annual Gem Exhibition

The fifth annual gem exhibition of the San Jose Lapidary Society will be held in the San Jose Woman's Club building at 75 South 11th Street, San Jose, California, on Saturday and Sunday, April 22nd and 23rd, 1950.

The San Jose Lapidary Society is a strictly amateur organization and each year it holds an exhibition for the purpose of promoting interest in lapidary work, gem cutting and jewelry making and to afford its members the opportunity to display the work which they have completed during the year. Each piece exhibited will be the work of some member of the Society and none of it will be for sale.

The exhibition will be open to the public. There will be no admission charge and a cordial invitation to attend is extended to each and every interested person. Visiting hours, from ten A. M. to nine P. M. each day.

This year the exhibits will again be displayed in the Society's own uniform showcases. The arrangement of the cases on the floor will be the same as that of last year as it was found that this arrangement permitted the visitors to view the show without crowding or inconvenience.

Remember:

The event—The San Jose Lapidary Society's Fifth Annual Gem Exhibition.

The place—The San Jose Woman's Club, 75 South Eleventh St., San Jose, Calif.

The date—Saturday and Sunday, April 22nd and 23rd, 1950.

The hours—ten A. M. to nine P. M. each day.

Admission—Free, Everyone is invited to the show.

Wisconsin Geological Society

Professor Frank L. Fleener of Joliet, Illinois, presented a lecture on "Turquoise", at the November meeting.

Several field trips have been taken for the purpose of locating Marcasite which will be used during the National Convention in Milwaukee, in June, 1950. A chartered bus trip has also been taken to the lead mine regions located in the southwestern part of the state.

A number of W. G. S. members also attended the meeting in Chicago on October 22nd, 1949, to hear Mr. Lelande Quick on his talk, "The Second Stone Age."

A new idea, "swap night", will be tried out in Milwaukee November 30th. A major mineral sale is again contemplated for the beginning of the year.

Libbie Beran
1820 W. Meinecke Ave.,
Milwaukee 6, Wis.

Cleveland Lapidary Society
Report on Special Meeting

On October 17th, 1949, we had the distinct pleasure of having as our guest speaker Mr. Lelande Quick, editor of the *Lapidary Journal*. The subject of Mr. Quick's talk was "The Second Stone Age."

He presented his subject in a very delightful manner, starting with the very first uses man made of stone, carried us down through the ages to the present time, never forgetting the use man (and woman) made of stones to adorn his (and her) person.

Mr. Quick also gave us some inside dope on the formation of a lapidary society, its growing pains and the ultimate which we hope to attain, perfection in gem cutting and a society so large we have a waiting list.

He also dropped a number of very valuable hints in reference to programs to interest the members and others in becoming members.

Our meeting room was just able to hold the crowd of some 125 persons and we received four applications for membership after the meeting.

We want to express our appreciation to Mr. Quick for his talk and the advice and council he gave us.

Report on Meeting — November 1, 1949

Our meetings have continued to draw interest from our members and their friends and this one was no exception.

We have had a number of requests to put on a demonstration of cabochon cutting, so we complied with that request.

Mr. Harold Bojeck hit upon the idea of assembling an expensive machine, cutting a stone at a single meeting, and he took over his job. He was limited to a total cost of $10.00. When the final figures were in, his cost was $9.36.

He set up a single arbor and used a second-hand washing machine motor. The motor and arbor were set up on a leaf from an old office desk. All holes, etc., had been drilled and parts fitted prior to the meeting so that only the putting together of the parts were necessary.

A member furnished an Agate blank and another member, who had never cut a stone in his life, was instructed how to cut this material. He cut a very nice stone of which he was justly proud.

Our main object was to demonstrate—first that it is relatively inexpensive to assemble equipment which would do acceptable work and secondly that with a very small amount of time and instructions an experienced person could turn out a stone which would be pleasing.

Every one we contacted seemed to feel that we had accomplished our purpose and that it was well worth while.

John M. Heffelfinger, Sec.-Trea.
7619 Redell Ave.
Cleveland 3, Ohio

Texas Mineral Society
Dallas, Texas

The Texas Mineral Society met November 8th at the Baker Hotel. The meeting was called to order by the President Thomas D. Copeland. Minutes of the October meeting were read and approved.

Dr. J. D. Boone, Jr., Head of the Geology Department of Arlington State College made a talk on "The Meaning of Western Scenery." He illustrated his talk with colored slides. There was a general discussion after Dr. Boone's talk.

There being no further business the meeting was adjourned.

Fred N. Bentley, Sec.-Trea.
5319 Alton Street,
Dallas, Texas

Whittier Gem and Mineral Society

The Whittier (California) Gem and Mineral Society was recently organized and the first meeting was held December 1 at the Whittier Union High School. Regular meetings will be held on the first and third Tuesday evenings of each month at the high school.

Officers are: Robert B. Myers, president; Ed Kantor, Vice-President; Miss Irene Thompson, secretary; and Al Styerwalt, treasurer.

It was through the efforts of Mr. Donald J. Henry, Professor of Geology at Mt. San Antonio College in Pomona, that the club was formed.

Mrs. Ralph Sharpless,
Publicity Chairman
9228 Gunn Avenue,
Whittier, Calif.

Mother Lode Mineral Society
(Modesto, Calif.)

The Mother Lode Society had a nomination of officers at its Annual Christmas Party. Final nomination and election will be held at the regular January meeting.

Those nominated were Paul Rayfield, president; Jack Wemyss, vice-president; Lois Wemyss, secretary-treasurer; Helen Wittorff and Royal Brown, directors.

Colored slides of specimens from all over the world were shown, with narration by Julian Smith. These slides were rented for the occasion from W. Scott Lewis of Hollywood, Calif., and are well worth the small fee they cost.

Mrs. Lois Wemyss, Sec.
231 Tuolumne Blvd.
Modesto, Calif.

Maricopa Lapidary Society

The year and a half old Maricopa Lapidary Society of Phoenix, Arizona, took the people at the Arizona State Fair by surprise at the wonderful display of polished materials displayed by 33 of its members.

The original display of 12 cases was added to at the last minute at the request of the mineral department which had 18 empty cases. These were filled to the amazement of every one, and the Maricopa Lapidary Society truely took top place in the Mineral Building.

Mrs. Fern Matteson,
1309 E. Weldon,
Phoenix, Ariz.

Passaic County Gemological and Mineral Society Passaic, New Jersey

The Passaic County Gemological and Mineral Society, held its last meeting December 6, for the year of 1949. The first meeting for 1950 will be held January 10th.

Aerial photography was discussed. Its purposes for laying out terrain and other important factors of value to prospectors, was especially stressed.

Motion picture film of Arizona and its natural resources was shown.

Joseph C. Hanzl, Secretary,
18 E. Second Street,
Clifton, New Jersey

CARE SEEKING FUNDS TO SEND NEW BOOKS TO KOREAN GEOLOGY SCHOOL

NEW YORK, N. Y.—The Department of Geology at Seoul National University, Korea, has been given a priority rating among overseas educational institutions which CARE is seeking to aid through its new Book Program.

According to a report just received from CARE's mission in Korea, the Department—only geology school in Korea—has only a few old Japanese books, and no recent texts or reference volumes on geology, metallurgy or allied subjects, Paul Comly French, Executive Director of CARE, announced, in asking for contributions to help the school.

Though mining is one of the major industries in Korea, Mr. French explained, under the Japanese occupation no courses in geology, metallurgy or allied subjects were provided in any of the institutions of higher education. Students could prepare in this field only if they could afford to travel to Japan.

"At the time of the liberation," Mr. French related, "the importance of organizing a department of geology was at once recognized. This was done in the College of Liberal Arts at Seoul University, despite the fact no recent texts or reference books were available.

"There are now some 30 students and three professors in the Department of Geology at the University. Even if good, up-to-date texts could be found, neither the students, the professors nor the university could afford to buy them. For a young country which is desperately in need of technicians in this field, there is comparatively nothing with which to train them. Contributions to the CARE Book Program, to send the latest and best geology and allied texts, would be an important aid in the development of Korea."

Under the Book Program which CARE, in cooperation with UNESCO, has added to its food and textile package service, funds donated by the American public are used to send new scientific and technical texts, published in English, to universities, libraries and technical schools in Europe and Asia. Geology, mining engineering, metallurgy and metallography are among the categories covered by the program. Actual selection of books is based on a bibliography compiled by a professional committee headed by Dr. Luther Evans, Librarian of Congress.

Cash donations in any amount can be sent to the CARE Book Program, 20 Broad St., New York 5, N. Y., or to any CARE office in the country. Contributions under $10 are pooled in a general fund. But donors of $10 or more can specify the country, institution and category of book—for instance: "Geology book to Department of Geology at Seoul National University, Korea." CARE will deliver a book in the donor's name, and will return the customary CARE receipt, signed by the recipient on delivery.

In addition to Korea, countries served by the CARE Book Program are: Austria, Belgium, Czechoslovakia, Finland, France, Italy, Greece, Japan, the Netherlands, Norway, Great Britain, and the three western zones of Germany and all Berlin. Negotiations with Poland and several Far East countries are pending.

To Europe For A Vacation!

Editor R & M:

I am leaving New York on December 17th for Europe for a vacation. I hope the visit some collectors and do a little collecting also and especially in England. May have an article for *Rocks and Minerals* when I return.

Please send me another R & M card by return mail so I can take it along with me.

Claude S. Bullen,
Ypsilanti, Mich.

December 3, 1949.

Ad Brings Good Results!

Editor R & M:

I am enclosing check to cover the cost of running another time my ad in *Rocks and Minerals*. I have had a very good response to the ad, have made some nice friends, and have received a gob of minerals.

Ash Lovett,
Mangum, Okla.

November 5, 1949.